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KEY TO PRONUNCIATION.

ä	far, father
ā	fate, hate
a or ă	at, fat
ã	air, care
ạ	ado, sofa
â	all, fall
ch	choose, church
ē	eel, we
e or ĕ	bed, end
ė	her, over: also Fr. *e*, as in *de; eu*, as in *neuf;* and *oeu*, as in *boeuf, coeur;* Ger. *ö* (or *oe*), as in *ökonomie.*
ẹ	befall, elope
ê	agent, trident
ff	off, trough
g	gas, get
gw	anguish, guava
h	hat, hot
h or ʜ	Ger. *ch*, as in *nicht, wacht*
hw	what
ī	file, ice
i or ĭ	him, it
i	between e and i, mostly in Oriental final syllables, as, Ferid-ud-din
j	gem, genius
kw	quaint, quite
ṅ	Fr. nasal *m* or *n*, as in *embonpoint, Jean, temps*
ñ	Span. *ñ*, as in *cañon* (căn'yŏn), *piñon* (pēn'yōn)
ng	mingle, singing
nk	bank, ink
ō	no, open
o or ŏ	not, on
ô	corn, nor
ȯ	atom, symbol
ọ	book, look
oi	oil, soil; also Ger. *eu*, as in *beutel*
ö or oo	fool, rule
ou or ow	allow, bowsprit
s	satisfy, sauce
sh	show, sure
th	thick, thin
ṯh	father, thither
ū	mute, use
u or ŭ	but, us
ü	pull, put
ü̆	between u and e, as in Fr. *sur*, Ger. *Müller*
v	of, very
y	(consonantal) yes, young
z	pleasant, rose
zh	azure, pleasure

′ (prime), ″ (secondary) accents, to indicate syllabic stress

THE ENCYCLOPEDIA AMERICANA

K the eleventh letter in the English and other alphabets of the modern languages of western Europe.

The character is derived, through the Greek, from the alphabet of the early Phœnicians, where its form is that of K reversed, 𐤊. The k represents the sound produced when the back of the tongue is brought into contact with the palate and the breath expelled. The sound-value of k is the same in all languages; but k is not employed in the modern Latin languages save in spelling foreign words or names. Nor does it occur in Latin save as an abbreviation (K or Kal.) for Kalendæ, K for the name Cæso, or for Carthago, etc.

In English the c of the Latin orthography of words from the Greek is always retained, even when it represents the sound of k, for example, sceptic, pronounced skeptic; and we are beginning to pronounce ceramic keramic. We even substitute c for k in Greek words and names, though in reading Greek we give to the k always its hard guttural sound: hence for us Alkibiades is (in sound) alsibiades, and even Kimon is simon.

The k in Greek names suffers a similar change in the modern Latin languages; but in German speech the true k sound in such names is retained: Ankyra, not ansyra, Korkyra, not corsyra; Kephalos, not sephalos.

In Anglo-Saxon and in Gaelic the k is always represented by c.

The guttural sound of k seems to have stood unchanged in ancient Greek and Latin, whether represented by that letter or by c; but in the modern languages derived from the Latin the k sound underwent great changes, becoming a sibilant equal to s, as «sezar» for Cæsar, or being «palatized» into the sound tsh, for example, Gr. kyriake, Ger. kirche, Scotch kirk, Eng. church; to produce this change the middle of the tongue, instead of the back of it, is brought into contact with the palate; in French pronunciation the k-sound of c in Latin words, as camera, carbo, carnalis, is changed to sh, and the words are written chambre, charbon, charnel.

Kaaba kä'bä, or kä'ạ-bạ. See Caaba.

Kabbala, kăb'ạ-lạ. See Cabala.

Käbul, kä-bool', or **Cabool,** Afghanistan, capital of the country and of the province of Kabul, situated at the west extremity of a spacious plain, in an angle formed by the approach of two ranges of hills, and (with the exception of a suburb) on the right bank of the Kabul River, which is spanned, in or near the city, by several bridges. It stands at the height of about 6,000 feet above the sea-level, and has a delightful climate in summer, but the winter is severe. The houses are in general slightly built of mud and unburnt bricks, and there are no public buildings of any importance, though many of the mosques are spacious and commodious. Kabul is now becoming an important centre of trade with India and central Asia, and its population is greatly increased in the summer season by the influx of traders and others. Estimated pop. 75,000.

Kabyles, kạ-bīlz'. See Berbers.

Kadi, kä'dĭ or kā'dĭ. See Cadi.

Kadiak, kăd-yăk', an island of Alaska, situated southeast of the peninsula of that Territory. It is about 100 miles long and 60 miles wide, has a rocky mountainous surface, and an irregular, deeply indented coast, with some good harbors. Near the coast the soil is somewhat fertile, but little of it is profitable for agricultural purposes. The interior is mostly covered with low forests of pine and other trees. Bears and foxes are common, but other fur-bearing animals have become comparatively rare. The salmon-fisheries afford the inhabitants their chief occupation. Pop. about 2,000.

Kadiak Bears. See Bears.

Kaffa, kăf'fä. See Feodosia.

Kafir-bread, kăf'ėr-brĕd, the edible spongy pith of the stems and cones of any of several species of cycads (q.v.) growing in South Africa, especially *Encephalartos caffer*. This substance resembles sago in its farinaceous character.

Kafir-corn, Indian millet (*Sorghum vulgare*) extensively cultivated by the half-civilized negroes of south-central Africa. It is called kaoliang by the Chinese. See Grasses; Millet.

Kafiristan, kä-fē-rĭs-tän' (Persian, «land of the infidels»), a region of central Asia northeast of Afghanistan, on the south slope of the Hindu Kush, and having as its southern boundary the Kabul River. Formerly the name was vaguely given to a much greater territory; it is now restricted to a country with an area of about 5,000 square miles, nominally under the government of the Amir of Afghanistan, but virtually belonging to an independent people. In the northern portion, which is mountainous, the surface is rugged and broken; in the south the land is mostly level or moderately undulating. Much of the soil has a high degree of fertility, and is adapted, especially in the valleys, to the cultivation of fruits and cereals of various kinds. Grapes are largely produced, from which is made an excellent wine. The number of the inhabitants is estimated at 200,000. They are said to be skilful workers in wood and metals, but their main pursuits are agricultural and those pertaining to the herding of cattle, sheep, and goats. In many of their traits — in features, complexion, beliefs, manners, and customs — they differ much from neighboring tribes, appearing to be of Aryan extraction, and they claim descent from soldiers of Alexander the Great. They are not without dissensions in the various tribal divisions in which they exist, but their isolation in a region of natural strength has enabled them to maintain a kind of political unity despite internal discords, as well as to preserve their independence against the invasions of other tribes. They have no literature, and in their language appear mingled traits of the Indo-Iranian dialects in their Iranian and Indian divisions. In religion they have largely withstood Mohammedan influences and preserved many of their tribal forms. Consult: Biddulph, ‹Tribes of the Hindu Kush› (1880); Leitner, ‹Kafiristan› (1881); McNair, ‹A Visit to Kafiristan› (Proc. Royal Geog. Soc. 1884); Robertson, ‹Kafirs of the Hindu Kush› (1896).

Kafirs, kaf'ėrz, **Kaffirs, Kaffres,** or **Caffres** (from Arabic *Kafir*, infidel or unbeliever), the principal race inhabiting southeastern Africa, a branch of the great Bantu family. The name is now chiefly restricted to the tribes occupying the coast districts between Cape Colony and Delagoa Bay. They differ from the negroes in the shape of the head, it being more like that of Europeans; in the high nose, frizzled hair, and brown complexion, which becomes lighter in shade in the tribes of the more southern districts. They are a tall, muscular race, the average height being from 5 feet 9 inches to 5 feet 11 inches, and frugal and simple in their habits. Their chief occupation is raising and tending cattle, and hunting; garden and field work is mainly performed by women. They are of a peaceful disposition, but in times of war they display considerable bravery, tactical skill, and dexterity in the handling of their assagais or spears, shields, and clubs, as has been shown in their engagements with the British forces. There are several distinct branches or families of Kafirs, but the tribes which recent events have specially brought to the front are the Pondos, the Fingoes, the Zulus, and the Swazi. Kafirs, especially of the Zulu tribe, are distributed in large numbers over Natal and Cape Colony, and have become to some extent civilized. Frequent hostilities have taken place between the British and one or other of the Kafir tribes, beginning almost with the first acquisition by Britain of the Cape Colony.

Kagoshima, Japan, a city in the island of Kiushiu, capital of Satsuma province, and of the prefectural ken of the same name, on the northwest shore of Kagoshima Bay. The town is well built and is an important industrial centre with a considerable export trade. The celebrated Satsuma porcelain is manufactured in suburban Tanoura. Kagoshima was the feudal seat of the powerful Shimadzu daimios, and in 1863 was bombarded and destroyed by the British owing to the murder of an Englishman; the reigning daimio refusing satisfaction. Here in 1877 Saigo (q.v.) set up the standard of rebellion, and here also he was overwhelmingly defeated a few months later. Pop. (1898) 53,481.

Kagu, kä'goo, the native name of the remarkable bird (*Rhinochetus jubatus*) peculiar to New Caledonia, where it was discovered only in 1860, and is now rapidly disappearing. It is the only species of a distinct family most nearly related to the sun-bitterns. The kagu is about the size of a domestic fowl, with short wings, rather long legs, a ralliform beak, and a long crest. When the wings are folded, the colors are mottled gray, the wings and tail barred with a darker shade; but when they are spread, the wings are seen to be barred and spotted with white and black arranged in a conspicuous pattern. The kagu is noteworthy for the extraordinary dances and antics which it performs.

Kaguan, kä-goo-än'. See Colugo.

Kahn, Julius, American politician: b. Kuppenheim, Baden, 28 Feb. 1861. Removing with his parents to California in 1866, he was educated in the public schools of San Francisco, and for ten years followed the theatrical profession. It failed to satisfy his ambition, however, and in 1890 he returned to San Francisco, where he studied law. In 1892 he was elected to the legislature of California, being admitted to the bar in 1894. He was elected to the 56th and re-elected to the 57th Congress as representative from the 4th district of California. He has championed with much energy the anti-Chinese bill and is regarded as one of the leaders of the movement to prohibit Chinese immigration to the United States.

Kahoka, kä-hō'kạ, Mo., city and county-seat of Clark County, on the Keokuk & W. railroad, 20 miles west of Keokuk, Iowa. It is an important shipping point for a large farming and stock-raising region and there are numerous grain elevators, besides flour-mills, brick yards, and fruit canning establishments. The city is governed by a mayor and council elected biennially. Pop. (1890) 1,425; (1900) 1,818.

Kai-fung, kī-fŭng', or **K'ai-Feng-Fu,** China, a walled city, capital of the province of Ho-nan, 450 miles southwest of Peking, and 11 miles distant from the Ho-ang-ho, or Yellow River. It was the capital city of China from 960 to 1129 and was then known as Pien-liang. The city has been visited 14 times by flood, 9 times by earthquake, and 6 times by fire. Kaifung is a station on the New Hankow-Peking railway. It has a large commercial trade with the interior. Pop. about 150,000.

Kai-ping, kī-ping', China, town in the province of Pe-chi-li, 80 miles north of Tien-Tsin. It is the centre of a large coal field, over 9,000 persons being employed in the mines. The output is over 800,000 tons annually. A branch railroad connects Kai-ping with the Trans-Siberian Railway.

Kaietur (kä-ẹ-toor') **Fall,** a famous waterfall in British Guiana, on the Potaro River, a tributary of the Essequibo. It was discovered in 1870. Its total height is over 800 feet, and the sheer descent of the water 741 feet, the width of the hard rock over which it plunges being 370 feet. The water has worn a great cavern in the softer underlying layers, and against the dark background thus formed the whiteness of the spray is contrasted with magical effects. The scenery about this great waterfall enhances its beauty and grandeur.

Kailas, kī'läs, the highest summit of the Gangri Mountains in Tibet, between the sources of the Indus and the Brahmaputra, having an altitude of over 20,000 feet. It is a sacred mountain of the Hindus, who formerly regarded it as the abode of their gods.

Kain, kān, **John Joseph,** American Roman Catholic archbishop: b. Martinsburg, W. Va., 31 May 1841; d. Baltimore 13 Oct. 1903. Educated at St. Mary's Seminary he was ordained priest in 1860 and was for several years stationed at Harpers Ferry, W. Va. In 1875 he was consecrated bishop of Wheeling, and in 1893 he was appointed titular archbishop of Oxyrychia as coadjutor to Archbishop Kenrick of St. Louis, succeeding to the archbishopric of St. Louis on the death of Archbishop Kenrick in 1895. Owing to failing health Bishop Glennon of Kansas City was made coadjutor in 1902, and succeeded him.

Kairwan, kīr-wän', Tunis, a town 80 miles southeast of Tunis the capital, situated in a barren, sandy plain, and surrounded by a wall; founded about 670. It is connected by rail with Tunis and with the port of Susa, 30 miles distant. It ranks next to Tunis in population and trade, and is one of the holy Mohammedan towns; it was formerly almost inaccessible to Christians. Under the administration of the French, by whom it was taken in 1881, many modern improvements have been made, among which not the least important is a good water-supply. It has a variety of useful manufactures, including morocco, carpets, copper utensils, saltpeter, etc. Kairwan was the first seat of Saracenic empire in Barbary, and still has many fine relics of its ancient grandeur in the fragments of beautiful architecture which abound there, besides a number of interesting mosques, one of them being of great magnificence. Pop. (1900) about 27,000.

Kaiser, kī'zėr, a title, the German equivalent for emperor. The Romans added the name of Cæsar to their own kings in honor of the «divine Julius,» and this passed to Kaiser in the 10th century. When the Holy Roman Empire was dissolved the imperial title was retained by the House of Hapsburg, the head of which since 1804 has borne the title of Emperor (Kaiser) of Austria.

Kaiser-Franzensbad. See FRANZENSBAD.

Kaiser Wilhelm Land. See NEW GUINEA.

Ka'ka, a large, slow-flying, brownish parrot (*Nestor meridionalis*) of New Zealand, which inhabits forests, where it goes about in noisy flocks, and nests in hollows of trees. Its food is miscellaneous, but consists principally of nectarous flowers and of the grubs hiding under bark, which it tears away by its powerful hawk-like beak. A near relative is the Kea (q.v.); and other species on New Zealand, Norfolk and neighboring islands have become wholly extinct since the occupation of those islands.

Kakabek'a Falls, a cataract of the Kaministiquia River, Ontario, Canada, 14 miles west of Port Arthur. The falls, which are noted for their picturesqueness, have a height of 130 feet, and their width is about 450 feet.

Kak'apo, the Maori name of a large ground-keeping, owl-like parrot (*Strigops habroptilus*), which is now nearly extinct, owing to its inability to withstand the dogs, cats, rats, etc., introduced by civilization, in addition to which its flesh is good to eat. Its terrestrial habits have led to such a reduction of the wing-muscles that the keel has nearly disappeared from the sternum and the bird is practically flightless.

Kak'ar, a sportsman's name for a muntjac (q.v.).

Kakarali, kăk-ạ-rä'lī, a South American tree (*Lecythis ollaria*), whose timber is much used in British Guiana for piling and structures exposed to salt water, since it endures well, and resists the boring of shipworms and the attacks of barnacles. The Indians beat its bark until it separates into thin layers convenient for use.

Kalahari (kä-lä-hä'rē) **Desert,** a region of South Africa, extending from the Orange River to Lake Ngami, and from lon. 26° E. nearly to the west coast; partly in British, partly in German territory; called a desert because it contains little water; but besides grass and creeping plants there are large growths of bushes, and also trees; great herds of antelopes roam over its plains; and on the game thus provided, as well as on the vegetable products, particularly water-melons and large tubers, a great number of Bushmen and Bakalahari subsist. The Kalahari is remarkably flat, and is intersected in different parts by the beds of ancient rivers. The soil is in general a light-colored soft sand, but in the ancient river-beds there is a good deal of alluvium, which, when baked hard, is so retentive that in some cases pools formed by the rain contain water for several months.

Recent studies have brought to light very interesting facts regarding the limestone basins of this region, peculiar formations, in which can be traced the influence of higher animal life on the shape of the earth's surface. These crater-like depressions served as watering-places for the large wild animals, and the crowding of great herds to these places, to drink and bathe, changed them from simple depressions to the walled basins which they now are, elephants and other animals, by rolling in the mud and rubbing against the walls, giving to the hollows their depth — sometimes 20 to 30 feet — and a diameter commonly of several hundred yards. The water in these basins contained lime carbonate in solution, and with the water drunk by the animals this carbonate disappeared, and the fresh spring-water absorbed another supply from the rock, thus deepening the depression. Scientists estimate that 600 to 800 years may have passed before the natural water-pools became basins. It is surmised that similar depressions in calcareous districts of the American prairies are due, in the same way, to the enormous herds of bisons which formerly inhabited them.

Kalakaua (kăl-ạ-kow′ạ) I., **David**, king of Hawaii: b. 16 Nov. 1836; d. San Francisco, Cal., 30 Jan. 1891. He was the son of Kepaakea and Keohokalole, the niece of Kamehameha I., and was elected, 12 Feb. 1874, to succeed Lunalilo, and reigned till his death. In 1887 he was compelled to grant a new constitution, which very greatly restricted the royal authority.

Kalamazoo, kăl-ạ-mạ-zoo′, Mich., city, railway centre and county-seat of Kalamazoo County; on the Kalamazoo River, and on the Michigan C., the Lake Shore & M. S., the Kalamazoo & S. H., the Grand Rapids & I., and the Chicago, K. & S. railways; 143 miles west of Detroit, 60 miles southwest of Lansing, and 45 miles south of Grand Rapids. It is in a rich agricultural region, the chief products of which are celery, fruit, and grains. Unlike the average city in western Michigan, Kalamazoo never was a lumber town. Located in the midst of a broad area of prairie land and oak openings, it was from the beginning an agricultural centre, with fresh-water, inland lakes in all directions and with the Kalamazoo River flowing along its eastern portion.

Industries. — Few cities of the United States of a corresponding population show such a diversity of industrial occupations. In 1904 there were 157 factories employing 6,499 persons, and representing an investment of $9,617,880. The chief manufactures of the city are paper, patent medicines, women's clothing, playing cards, wagons and carriages, machinery, caskets, coffins, foundry products, windmills, furniture, and flour. The nine paper mills employ more than 2,000 workers; the card factory, 900; the regalia and clothing factories, 1,000. The celery-raising industry, by which Kalamazoo is perhaps best known, employs more than 700 skilled workmen, chiefly from Holland, and represents an annual output valued at nearly $2,000,000.

Banks, Commerce, etc. — The seven national and savings banks reported in 1904: $650,000, capital; $539,367, surplus; $5,169,032, loans, discounts, and stocks; and $5,485,828, deposits. The total bank clearings were $35,450,000. The freight shipped and received in 1904 aggregated 325,342 tons. The total postal receipts were $534,354.

Institutions, etc. — Some of the prominent public institutions are the Kalamazoo College, opened in 1855 under the auspices of the Baptist Church; the Michigan Female Seminary, founded in 1886 under the auspices of the Presbyterian Church; Nazareth Academy (R. C.), one Normal School, Borgess and Queen City hospitals, Saint Anthony's School for feeble-minded children, Michigan Asylum for the Insane, Academy of Music, and the public library. Other prominent buildings are the Y. M. C. A., the City Hall, several fine churches, and the high school. The streets are well paved, and the electric light plant and waterworks owned and operated by the city.

Government, History and Population. — The government is vested in a mayor, public commissioners, and a council of nine members, elected annually. The school board is chosen by popular election. Kalamazoo was settled in June, 1829, by Titus Bronson of Connecticut. It was incorporated as a village in April, 1843, and for many years enjoyed the distinction of being the largest village in the United States. It was made a city in April, 1884. Pop. (1880) 11,937; (1890) 17,853; (1900) 24,404.

Charles S. Hathaway,
Kalamazoo Board of Trade.

Kalamazoo, a river which has its rise in the northwestern part of Hillsdale County, Mich., and flows west and northwest into Lake Michigan. From the source to the city of Kalamazoo it makes three southward curves, but from Kalamazoo the course is generally northwest. Its whole length is about 200 miles, only 50 of which are navigable. At the mouth is a good harbor for vessels of about 100 tons. The water-power is extensive, and has been of great value in the development of the southwestern part of Michigan. Allegan, Kalamazoo, Battle Creek, and Marshall are on this river.

Kalb, Johann, yŏ′hän kålb, Baron de, officer in the American Revolution: b. Huttendorf, Bavaria, 29 July 1721; d. Camden, S. C., 19 Aug. 1780. After serving in the French army as lieutenant he became a brigadier-general in 1761. He came with Lafayette to America in 1777, and offering his services to Congress was appointed a major-general in September of that year. After serving under Washington in Pennsylvania and New Jersey till the spring of 1780, he was appointed second in command in the Southern army under Gates. He fell mortally wounded at the battle of Camden, S. C., in the following August, dying three days after. In 1886, on the 106th anniversary of the battle, a bronze statue of the baron was unveiled at Annapolis, Md. Consult Kapp, ‹Leben des amerikanischen Generals, Joh. Kalb› (Stuttgart 1862; New York 1870).

Kale, or **Borecole,** a cruciferous plant (*Brassica oleracea*, var. *acephala*), differing from cabbage most strikingly in the non-formation of heads, the leaves being loose and free. It is largely cultivaled as a pot-herb, especially in the South, where it generally withstands the winter. It is rather coarse in texture and flavor, but frosts modify both somewhat. In some sections it is extensively used for cattle-feeding. One of the largest producing regions is that in the vicinity of Norfolk, Va., which ships about 200,000 barrels to the markets each year. The varieties cultivated in America are nearly all treated as annuals, being grown from seed much like late cabbage. Some varieties, however, are perennial and may be propagated by cuttings, etc. For cultivation see Cabbage.

Kaleege, kạ-lēj′, or **Kalij, Pheasants,** a sportsmen's name in India for the pheasants of the genus *Genœus*, which range along the foothills of the Himalayan range and eastward to the China and down the Malay Peninsula to Java. They are of medium size, richly dressed, with flattened crests, naked cheeks and spurs on the male. White is conspicuous in the plumage of most, so that they are sometimes called silver pheasants, especially the Chinese species (*G. nycthemerus*), frequently seen in parks and menageries. All are attractive as game birds, especially the Himalayan white-crested and black-crested.

Kaleidoscope, ka-lī'dō-skōp, an optical instrument invented by Sir David Brewster in 1817. It consists of a tube through the length of which pass two mirrors or reflecting planes, which are hinged together along one edge, and make with each other an angle of 180 degrees; while the one end is fitted up with an eye-glass, and the other is closed by two glasses, at a small distance from each other, between which are placed little fragments of glass or other colored objects. The eye looking into the tube perceives these objects multiplied, and the slightest moving of the instrument produces new figures.

Kalends. See Calends.

Ka'ler, James Otis, «James Otis,» American writer for young people: b. Winterport, Maine, 19 March 1848. His most popular juvenile tale is ‘Toby Tyler’ (1880). Among his other very numerous books may be named: ‘Raising the Pearl’; ‘Tom and Tip’; ‘When Israel Putnam Served the King’; ‘The Wreck of the Circus.’

Kalevala, kä-lĕ-vä'lä, **The,** the great Finnish epic. It is composed of ancient popular songs, orally transmitted until the early 19th century, when they first began to be collected for literary purposes. Scattered portions were published in 1822 by Zacharias Topelius. But the present form of the poem is due to Elias Lönnrot of Helsingfors, who traveled among the peasantry, and recorded the material exactly as he heard it. His first edition (1835) contains 12,078 lines in 32 runes (cantos); a second edition (1849) 22,793 lines in 50 runes. Lönnrot was the first to arrange the runic verses as a systematic whole. The poem is in eight-syllabled trochaic verse, alliterative but unrimed. An idea of its style may be obtained from the ‘Hiawatha’ of Longfellow, largely an imitation. There is a complete English rendering by J. M. Crawford (1888).

Kali, kä'lē, a Hindu goddess represented with four arms, wearing a necklace of skulls, and the hands of slaughtered giants round her waist as a girdle. Her eyebrows and breast appear streaming with the blood of monsters she has slain and devoured. One hand holds a sword, another a human head. She is the goddess of death and destruction, and goats and other animals are sacrificed on her altars.

Kalidasa, kä-lĭ-dä'sä, the greatest poet and dramatist of India. Native tradition assigns him to the 1st century B.C., but western scholars place him as late as the 6th century A.D. He was one of the nine «gems,» or poets, at the court of King Vikramanditya, but the fact that several monarchs were so named makes his date no more definite. His most famous work is the drama ‘Sakuntalā,’ translated by Sir William Jones in 1789, and highly praised by Goethe. This translation helped to call the attention of the Occidental world to Sanskrit studies. Kalidasa wrote two other plays, the ‘Vikramorvaśī’ and ‘Mālavikā and Agnimitra,’ and considerable lyric verse. Many doubtful works have also been attributed to him with various degrees of probability. His literary value has long been conceded. The most recent English version of the ‘Sakuntalā’ is that of Edgren (1894).

Kalisch, kä'lĭsh, **Isidor,** American rabbi and author: b. Krotoschin, Prussia, 15 Nov. 1816; d. Newark, N. J., 11 Nov. 1886. Educated at the universities of Berlin, Breslau, and Prague, on the outbreak of the revolution of 1848, he left Germany, and after a brief stay in London came to New York in 1849. For some years he officiated as rabbi in Cleveland, Cincinnati, Milwaukee, Indianapolis, Detroit, and Leavenworth, Kan. In 1868 he established a school in New York, which did not succeed. In 1870 he was called to Newark, N. J., as rabbi, and two years later to Nashville, Tenn. In 1875 he returned to Newark, where he devoted himself until his death mainly to literary work. He was a versatile author, and his works cover a wide field, from a volume of German poems and a translation of Lessing's ‘Nathan the Wise’ to a decipherment of a Phœnician inscription found near Sidon, a sketch of the ‘Sefer Yetsira,’ a Kabbalistic work. He took an active part in the American Jewish reform movement and was a frequent contributor to the Jewish press.

Ka'lium, another name for the metal potassium, whence its symbol K is derived.

Kalmar, käl'mär, or **Calmar,** Sweden, city, the capital of Kalmar Län (county); on Kalmar Sound, at a place where the distance to the island of Oland is not more than five miles. Kalmar is about 190 miles, in direct line, southwest of Stockholm. A part of the city is on the mainland, and a part on three small islands. The town, which was formerly strongly fortified, though the fortifications are now in great part leveled, has a good harbor, a handsome cathedral, and a fine castle, in which, on 20 July 1397, the «Union of Kalmar» was signed, which settled the succession to the three northern kingdoms upon Margaret of Denmark and her heirs. The commerce of the town is considerable, and it has manufactures of matches, chicory, and tobacco, and some ship-building. Pop. (1902) 12,847.

Kal'mia. See Mountain-Laurel.

Kal'mucks, a nomadic, warlike Mongol race, inhabiting parts of the Chinese empire, Siberia and European Russia. They have been great warriors from very early times, fought many bloody battles with the Tartars, with the Chinese, and among themselves, and made predatory expeditions as far west as Asia Minor. They are intrepid soldiers, splendid horsemen, and troops of them are attached to almost every Cossack regiment. Physically the Kalmucks are small of stature. They number altogether perhaps 700,000.

Kalong'. See Flying-fox.

Kal'pa, in Hindu chronology, a day, or a a day and night of Brahma, or a period of 4,320,000 or 8,640,000 solar-sidereal years. A great kalpa comprises the life of Brahma.

Kalpi, käl'pē, or **Calpee,** British India, a town in Jalaun district, Northwest Provinces, on the right bank of the Jumna, about 45 miles south-southwest of Cawnpore. The original town stood on the plain, remote from the river; but repeated Mahratta incursions induced the inhabitants to remove it to its present position among extensive ravines, where there is a small fort, which commands the navigation of the Jumna. It carries on a considerable trade, principally in cotton, and is noted for its manufactures of paper and refined sugar, the latter said to be the finest in the world, but too high-priced to be in general demand. During the Sepoy mutiny Kalpi became a principal rendezvous of the revolted Gwalior contingent, which was signally defeated, first by Sir Colin Campbell, in the vicinity of Cawnpore, on which it had previously made an unsuccessful attack, and afterward at Kalpi itself by Sir Hugh Rose, 26 May 1858. Pop. (1901) 15,124.

Kama, kä'mä, the largest tributary of the Volga, rises in the Ural Mountains, on the eastern frontiers of the Government of Vyatka, in Russia; flows first north, then northeast into the Government of Perm, then circuitously south-southeast to the town of Perm, then southwest into the Government of Kasan, and about 40 miles below the town of that name, after a course of about 1,200 miles, joins the left bank of the Volga, almost doubling its volume. It is navigable almost throughout its whole course, and a canal connecting it with a tributary of the Dwina, gives water communication between the Caspian Sea and the Arctic Ocean.

Kama, or **Kâmâdîva**, in Hindu mythology, the god of love and marriage. The accounts of his origin vary in the sacred writings of India. According to one authority he sprang from Brahma's heart. His wife is Rati or «Pleasure.»

Kamakura, kä-mä-koo'rä, Japan, village, about 11 miles south of Yokohama. It is said to have been founded in the 7th century. From about 1190, for 400 years it was the political centre of Japan, the residence of many of the powerful men, and frequently the battle-ground for supremacy and power. It is no longer visited as a ruling city, but as a beautiful place, with many interesting relics of antiquity. See DAIB TSU.

Kama'la, a plant and drug known, under various names, to Indian and Arab physicians, as a specific against the tapeworm. It occurs as a brick-red powder, adherent to the fruit of the euphorbiaceous plant *Rottlera tinctoria*, formed by minute roundish, semi-transparent granules, mixed with stellate hairs. The active principle of the powder lies in the 80 per cent of resin it contains, which also supplies the coloring matter, called rottlerin, used as a silk dye.

Kamas'si, a South African tree related to the oleander (family *Apocyanaceæ*), the wood of which is extremely hard and durable, and is used in wagon-building, for tool-handles and similar purposes. The tree bears fragrant flowers.

Kambodja, kăm-bō'ja, a Burmese tree (*Plumeria acutifolia*) related to the oleander, which is commonly used as a shade-tree in the villages of that country.

Kamchatka, käm-chät'kä, or **Kamtchatka**, Siberia, a large peninsula of the Russian empire, 850 miles long from north to south, and of irregular breadth, the maximum being about 250 miles. It has an area of 100,000 square miles. The coasts are dangerous of approach on account of outlying reefs. A lofty range of volcanic mountains traverses the country in a southwesterly direction, with many peaks between 7,000 and 16,000 feet high. The snow line, in lat. 56° 40', is at an elevation of 5,260 feet. Dittmar, a Russian traveler, devoted three years to the exploration of the geology of Kamchatka. He traced five successive formations, and found 17 volcanoes in active operation. Numerous rivers have their rise in the heights. The Kamchatka, with its affluent the Yelovka, is navigable for 150 miles. The most fertile portion of the peninsula for agricultural purposes lies along the valley of this river. The Russian settlers here raise oats, barley, rye, potatoes, and garden vegetables, but the rest of the country is little adapted for culture. The climate is very severe; the winter lasts nine months, and frost is common at all seasons. The mean annual temperature at Petropavlovsk on the east coast is 28.5°, while at Tigil on the west it is 43°. The average temperature of summer at the former place is 55.5°, and that of winter 19°, but the thermometer has been known to fall as low as —25°. Earthquakes are frequent and violent. Animal life is very abundant, and fish swarm in the seas and rivers. The wild animals, yet abundant in the more sequestered localities, are bears, wolves, reindeer, argalis or wild sheep, black, red, and gray foxes, ermines, sables, and otters. Wild fowl are very numerous. The principal varieties of fish are herrings, cod, and salmon. Whales are numerous in the adjacent seas. The mountains are covered with forests of birch, larch, pine, and cedar, of considerable size in the south, but diminishing northward until the northernmost portion of the territory is covered only with reindeer moss.

The Kamchadales, the principal native tribe, are of diminutive stature, but stout, with flat features, small eyes, thin lips, lank black hair, and scarcely any beard. They are a peaceable, honest, lazy, and intemperate race. In winter they reside in a sunken hut, in summer in one elevated on poles some 13 feet from the ground. Their dress is equally adapted to the changes of temperature, being of fur in winter and nankeen in summer. They are nominally governed by their own chiefs, under the jurisdiction of the Russian *ispravnik*, or chief judge, and the most of them are Greek Catholics. Dog trains are used as the means of transport. The other principal tribe are the Koryaks, who live north of lat. 58°. While the Kamchadales are hunters and fishermen, with fixed habitations, the Koryaks are a wandering tribe, subsisting on the produce of the reindeer, and differing from them in language and mode of life. The commerce of Kamchatka is chiefly with Okhotsk. Its exports are furs, skins, oil, etc. Its imports are flour, sugar, dry goods, whiskey, rice, and coffee, almost all passing through the port of Petropavlovsk, the capital, on Avatska Bay. Pop. of capital, 8,000.

Kamehameha, kä-mä"hä-mä'hä or kä-mē-hä'mē-hä, the name of five kings of the Sandwich or Hawaiian Islands. KAMEHAMEHA I., surnamed the «GREAT»: b. 1753; d. Kailua, Hawaii, 8 May 1817. Becoming head chief of part of the island of Hawaii in 1781 he presently subdued the entire group of islands, becoming ruler of the whole in 1811. He was progressive in his views and encouraged intercourse with Europeans. He was succeeded by his eldest son, KAMEHAMEHA II. (LIHOLIHO):

b. Hawaii 1797; d. London 14 July 1824. He was intemperate but treated the missionaries kindly, professed Christianity, and recommended his subjects to do likewise. Anxious to secure the friendship of England he went thither with his queen, Kamamalu, but both died soon after arriving in London. He was succeeded by his brother KAMEHAMEHA III. (KAVIKEAOULI), surnamed the «GOOD»: b. 7 March 1814; d. Honolulu 15 Dec. 1854. He came to the throne in 1833, the islands having been ruled by a regency since 1824. He introduced a constitutional form of government in 1840, and the independence of the islands was acknowledged by the United States in 1842 and by Belgium, Great Britain, and France in 1844. The more important public offices in his reign were filled by foreigners. He was succeeded by his adopted nephew KAMEHAMEHA IV. (ALEXANDER LIHOLIHO): b. 9 Feb. 1834; d. Honolulu 30 Nov. 1863. He married in 1856 Emma, adopted daughter of Dr. Rooke. In 1860 he founded the Queen's Hospital in Honolulu, personally soliciting subscriptions for this object, in which he took the deepest interest. His elder brother, Lot Kamehameha, succeeded him as KAMEHAMEHA V.: b. 11 Dec. 1830; d. Honolulu 11 Dec. 1872. He proclaimed a new constitution (less democratic than its predecessor), in 1864, satisfactory to the majority of the Hawaiians but distasteful to the foreign population. He never married and left no heir to the throne.

Kamehameha, Order of, an Hawaiian secret society founded in Honolulu in 1864 by Kamehameha II., the then reigning king of the Sandwich Islands. The order is divided into three classes. The badge of the order is a white enameled cross with gold rays surmounted by a crown.

Kamerun, kä-mē-roon'. See CAMEROONS.

Kames, Lord. See HOME, HENRY.

Kamila, kä-mē'lä, or **Kamala,** the glandular hairs of a small euphorbiaceous tree (*Mallotus philippensis*), widely distributed in eastern Asia and Australia. They are ground into a resinous powder which imparts a deep brick-red color to alkaline liquids, alcohol, ether and chloroform, and forms a rich dye especially applicable and extensively used for silk. The same name variously spelled is given to the tree.

Kaministiquia, ka-mĭ-nĭs-tĭ-kē'ą, a river in Canada which has its rise near Lake Nipigon in the province of Ontario, and flows south into Thunder Bay, an inlet of Lake Superior. The town where the Canadian Pacific railroad crosses this river is named after the river. Along the course are several expansions of the river or lakes. Before the railroad entered this section this river and its tributaries formed important routes of travel. Its advantages for transportation were of great importance to the government at the time of the Riel Rebellion (q.v.) in 1870.

Kaminski, kä-mēn'skē, **Stephan,** American Polish Catholic Independent bishop: b. German Poland, 26 Dec. 1859. He was educated in Poland, came to the United States in 1884; was ordained priest in 1893; was rector of various parishes; from 1897 edited and published the 'Warta,' a Polish weekly; and in 1898 was consecrated bishop. He was a leader in the independent church movement.

Kammat'ograph, The, a photographic camera in which a circular glass plate takes the place of the celluloid film for moving the pictures. The plate can be made to rotate rapidly by means of a multiplying gear, and at the same time to traverse laterally. A small lens forms an image upon the plate, and when the plate is put in motion these images are multiplied into a series of pictures arranged in a spiral. The plate is developed in the same way as an ordinary negative, and a positive is then taken from it. To display the pictures it is only necessary to place the positive in the camera and to arrange it so that the beam from the lantern close to it can pass through the lens. The plate is then rotated as before, the succession of pictures projected upon the screen reproducing the original movement. About 600 pictures can be photographed during the motion of a single plate at the rate of 12 or 14 a second.

Kam'loops, Canada, city in the province of British Columbia; on the Thompson River at the junction of the north and south branches, and on the Canadian Pacific railroad; about 255 miles northwest of Rossland and 260 miles northeast of Vancouver. The place where the city now stands was once used as a trading post by the Hudson's Bay Company, but a permanent settlement was made in 1820. Its growth was slow until mining began in the vicinity, and in 1892 it was incorporated. It has several manufacturing establishments, the chief of which are lumber-mills, mining-implement works, wagon factories, tanneries, and a woolen mill. The waterworks and the electric-light plant are owned by the city. The government seat for the Yale District is Kamloops, and the Dominion and Provincial governments have here land and registry offices. It has a mild climate, and in the vicinity in the river valley are many fine farms. Nearby are mountains and small lakes noted for the beauty of their scenery. Pop. (1902) 1,671.

Kampen, käm'pĕn, or **Campen, Jacob de,** Dutch Anabaptist leader. When he and his followers were driven out of Upper Germany, they attempted to diffuse their dogmas over the Low Countries. In 1534 John of Leyden nominated him bishop of Amsterdam, but on attempting to take possession of his see, he met with a cruel death at the hands of the people.

Kampen, or **Campen, Jan van** (so called from the town of Kampen), Dutch scholar: b. Kampen, Holland, about 1490; d. Freiburg 1538. He was professor of Hebrew at Louvain 1519–31. He wrote a Latin paraphrase of the Psalms, which has been translated into the chief European languages.

Kampen, Nikolaas Godfried van, Dutch historian: b. Haarlem 15 May 1776; d. Amsterdam 15 March 1839. He became professor of English and German in the University of Leyden in 1815. Among his historical and literary works, many of which were translated into German, are: 'History of the Literature of the Netherlands' (1812); 'History of French Domination in Europe' (1815–23); 'History of the Influences of the Netherlands Outside of Europe'

(1831–3). Consult: ‘Life,’ by S. R. Van Campen (1887).

Kampen, or **Campen,** Holland, a town and port in the province of Overyssel, 45 miles east-northeast of Amsterdam, on the Yessel near its influx into the Zuyder Zee, and where it is crossed by a bridge. Its principal buildings are a church of the 14th century, an elegant town-house, built in an antique style, and a custom-house. A theological school is located here. Anciently it was one of the most flourishing of the Hanse towns; and its commerce after a period of decline has again to some extent revived. Its manufactures also suffered, but it still produces machinery, steam-engines, hosiery, cigars, etc. It has also ship-building yards. Several canals intersect it, and a railway line from Germany through Zwolle terminates here. Pop. (communal) 20,000.

Kamphausen, Adolf Hermann Heinrich, ä'dōlf hĕr'män hĭn'rĭH kamp'how-zĕn, German theologian: b. Solingen 10 Sept. 1829. He was educated at Bonn, in 1855 became secretary of Karl Josias Bunsen, whom he assisted in the latter's ‘Bibelwerke,’ and in 1863 was appointed professor of theology at Bonn. In 1871–90 he was active as a member of the theological commission for the revision of Luther's translation of the Old Testament. He resigned all professorial duties in 1901. His publications include: ‘Das Lied Moses’ (1862); ‘Die Hagiographen des Alten Bundes nach den überlieferten Grundtexten übersetzt’ (1868); ‘Das Buch Daniel’ (1893); ‘Das Verhältnis des Menschenopfers zur israelitischen Religion’ (1896). He also edited Daniel (1896) for Haupt's ‘Polychrome Bible.’

Kan-Su, kăn-soo', an inland province of China, in the northwestern part; area, about 125,380 square miles. At one time Shan-Si, on the east, was a part of Kan-Su, and until 1865 its jurisdiction extended over a much greater extent of territory than at present. The capital is Lan-Chau. The province is rich in minerals and hunting for the sake of the fur is one of the chief occupations. Tobacco of a superior quality is raised in this province. Pop. about 10,000,000.

Kanakas, kạ-nak'ạz, a popular name given the natives of Hawaii, New Caledonia, New Hebrides, and other islands in the South Seas.

Kananur, kä-nạ-noor', or **Cananore,** British India, a seaport town in the district of Malabar, presidency of Madras, 44 miles northwest of Calicut. It forms a municipality, and contains various public offices, jail, dispensary, schools, custom-house, etc. There are Anglican, German, and Roman Catholic missions here, and a number of mosques. It has a small trade by sea, but its chief importance is as a military station and the headquarters of the Malabar and Kananur force, being garrisoned by one European and one native regiment. There is a fort of triangular area, built by the Dutch and occupied by them till 1766. Pop. 27,418.

Kana'ri, or **Canari,** a tree of the genus *Canarium* (q.v.), many species of which flourish from India to Australia and the Philippines. The foliage is abundant and handsome, and the wood is hard, heavy and suitable for cabinet-work, house-trimming, etc. The fruit is a drupe with a hard oily kernel, which forms the particular food of the great cockatoos of the region. The kernel of *C. commune,* known as Java almond, is eaten by the natives either fresh or roasted; and the Amboynese dry it, grind it and bake the flour. Some other species also furnish edible kernels; and from all an oil may be pressed, said to be better than cocoanut oil, both for cooking and for use in lamps. An oil is obtained from the bark resembling balsam copaiba (see COPAIBA). These trees also yield the medical resin elemi, and a gum called black damar.

Kanawha River. See GREAT KANAWHA RIVER.

Kan'chil, the smallest species of chevrotain (q.v.). It inhabits Java and neighboring islands, is less than a foot tall, and is proverbially quick and clever in its movements and hiding in the forest. Its scientific name is *Tragulus javanicus.*

Kandahar, kăn-dä-här', or **Candahar,** Afghanistan, one of the largest cities of the principality, on a fertile and well-cultivated plain, 3,484 feet above the sea, 200 miles southwest of Kabul. It is enclosed by a mud wall 27 feet high, with a large tower at each of the four corners, 54 semi-cylindrical bastions, and a broad and deep ditch in front, capable of being filled with water from the river. There are six gates, each protected by double bastions. The circumference of the city is nearly four miles. One of the most imposing buildings is the octagonal, domed structure containing the tomb of Ahmed Shah. It is claimed that this city was founded by Alexander the Great. Kandahar is chiefly supported by the transit trade, but it has important manufactures of felt and silk. It was held by the British in 1839–42, and again in 1879–81. Pop. variously estimated at from 25,000 to 100,000.

Kandy, kăn'dē, or **Candy,** Ceylon, one of the chief towns on the island, is situated near the centre, 72 miles northeast of Colombo, at the height of about 2,000 feet. «Kandy is uniquely beautiful — the most charming little town in the world,» travelers usually describe it. It is situated in a valley surrounded by hills, and boasts an artificial lake, Buddhist and Hindu temples, including the Daladá Máligáwa, the most sacred Buddhist temple in the world. This contains the so-called relic of Buddha's tooth, and also many ancient manuscripts written in Pali and Sanskrit. «The Pavilion,» or official residence of the governor, is one of the finest structures in Ceylon. Kandy is connected by railroad with Colombo. The botanic gardens of Peradenia are three miles from Kandy. Kandy was the capital of the ancient kings of Ceylon. Pop. (1901) 26,915.

Kane, Elisha Kent, American Arctic voyager: b. Philadelphia 20 Feb. 1820; d. Havana, Cuba, 16 Feb. 1857. He was graduated as M.D. in the University of Pennsylvania in 1842, and shortly afterward became surgeon to the American embassy to China. After extended travels in India, Egypt, and the continent of Europe he returned to America in 1846, and was employed in the government survey of the Gulf of Mexico. In 1850 he obtained the appointment of senior medical officer to the expedition of two vessels, the Advance and the Rescue, which sailed from

New York on the 22d of May in that year in search of Sir John Franklin. On the return of the expedition Dr. Kane published 'The United States Grinnell Expedition in Search of Sir John Franklin — a Personal Narrative.' On the 31st of May 1853, the Advance alone, under Dr. Kane's command, sailed again from New York to resume the search, and proceeding up Baffin's Bay and through Smith's Strait, reached lat. 78° 43′ N. Here the Advance remained frozen up for 21 months, and was finally abandoned because provisions were becoming scarce and scurvy and other diseases had made their appearance. The object now was to reach the Danish settlements in Greenland, about 1,300 miles distant. This long and perilous journey, partly in boats and partly in sledges, was accomplished, after 10 weeks of severe privation, with the loss of only one man, and that by an accident. In 1856 Dr. Kane published: 'The Second Grinnell Expedition,' and was awarded gold medals from Congress, the New York legislature and the Royal Geographical Society. Consult: Elder, 'Biography of Elisha Kent Kane' (1857); Greely, 'American Explorers' (1894).

Kane, John Kintzing, American jurist: b. Albany, N. Y., 16 May 1795; d. Philadelphia, Pa., 21 Feb. 1858. He was graduated from Yale in 1814, was admitted to the bar in 1817, entered practice in Philadelphia, was elected to the Pennsylvania legislature as a Federalist in 1823, later became a Democrat, and supported Jackson in the canvass of 1828. In 1845 he became attorney-general of Pennsylvania, in 1846 United States district judge for Pennsylvania, in 1856 president of the American Philosophical Society. He won distinction by his legal attainments and his decisions in patent and admiralty law, but his commitment of Passmore Williamson for contempt of court in an action under the Fugitive Slave law was attacked by the Abolitionists.

Kane, Sir **Robert John,** Irish chemist: b. Dublin, Ireland, 24 Sept. 1809; d. there 16 Feb. 1890. He was educated for the medical profession and in 1832 became a member of the Royal Irish Academy. In the same year he founded the 'Dublin Journal of Medical Science' and was its editor for two years. From 1834 to 1837 he was professor of natural philosophy to the Royal Dublin Society; in 1846 originated the Museum of Industry in Ireland. He was knighted the same year, was president of Queen's College, Cork, for several years prior to his resignation in 1873, and in 1876 was elected president of the Royal Irish Academy. He wrote: 'Elements of Chemistry' (1842); 'Industrial Resources of Ireland' (1884); etc.

Kane, Pa., borough in McKean County, on the Baltimore & O., the Philadelphia & E., the Pennsylvania, and the Pittsburg & W. R.R.'s, 95 miles southeast of Erie, 175 miles north of Pittsburg and 122 miles from Buffalo. There are here several of the largest window glass factories in the world, plate glass and bottle factories, lumber-mills, wooden-ware factories and other flourishing industries. There are extensive natural gas and oil wells and deposits of silica in the surrounding country which are of great commercial benefit to the town. On account of its elevation of 2,000 feet, Kane is an attractive summer resort, with good hunting and fishing grounds in the vicinity. It was first settled in 1859 and became a borough in 1887. The government is vested in a burgess and a council of 9 members elected every three years. Pop. (1890) 2,944; (1900) 5,296.

Kang-Hi, kăng-hē′, or **K'ang-Hsi,** emperor of China: b. 1655; d. 1722. He succeeded his father, Shun-Chih, founder of the Manchu dynasty, in 1661, but until he was 14 the government was administered by a regency. Kang-Hi not only greatly strengthened his empire, but extended it and governed with vigor and wisdom. He was favorably inclined toward the progress of Christianity; manifested great interest in the arts and sciences of the Europeans, and liberally patronized the missionaries. During his reign many important books were published under his oversight, such as the 'Imperial Dictionary'; a literary concordance in 110 volumes styled 'Pei-Wen-Yun-Foo,' and two large encyclopædias.

Kangaroo′, an Australian marsupial of the family *Macropodidæ.* The word is derived from a native name of the giant kangaroo. The *Macropodidæ* are readily distinguished from other marsupials by their shape. The head is small, with large mule-like ears; the neck slender, the trunk narrow before and very massive behind; the fore limbs small and weak with five toes and used chiefly as hands; the hind limbs long, extremely powerful, four-toed, and serving as the chief organs of locomotion; and the tail thick, heavy, and muscular, serving to support the body, in combination with the hind legs, as on a tripod. The dentition is noteworthy, having a somewhat rodent-like appearance. There are three pairs of incisors above, presenting a sharp cutting edge which the single pair of lower incisors passes like the blade of a shears. Canines are reduced to one in the upper jaw. The premolars are two on each side of each jaw. The four pairs of molars are flat-crowned and more or less cross-ridged, as well as tuberculate. The kangaroos are strictly vegetarian, and in Australia represent the deer, antelopes and hares of other regions. About 50 species belonging to 12 or 15 genera have been described from Australia and the neighboring islands. The giant kangaroo (*Macropus giganteus*), the largest, is frequently exhibited in zoological gardens. This, the first of the kangaroos known to white men, was discovered by Capt. Cook during his exploring voyage in 1770, and was described under the name *Didelphys gigantea* from specimens brought home by him. When standing erect in the attitude of scenting danger it is nearly as tall as a man, and when in full flight propels itself by bounds of 12 to 15 feet. On account of its destructiveness to herbage on the sheep-ranges, as well as for sport, it is much hunted by the colonists, a favorite method being coursing. When brought to bay by the hounds it proves no mean antagonist, and frequently kills a dog by seizing it in its arms and ripping it open with the great hind toe. As in other kangaroos the hind feet have a peculiar structure; the fourth toe is enormously developed and furnishes almost the sole support; the fifth is of moderate size; in sharp contrast the second and third toes are minute, slender, and bound together so that only their sharp claws project from the skin, their only function being to comb and cleanse the fur, The one or two young are born in an exceedingly helpless state, and after being placed in the pouch of the female remain attached by their mouths to the nipples for several weeks or months; at first they are quite incapable of sucking, and the milk is injected into their mouths by the periodical contraction of the muscles of the mammary glands. Even after they are able to run about, they return to the mother's pouch for temporary rest and shelter. Closely related are the red kangaroo (*M. rufus*) and other species inhabiting the mountains, and the numerous species of large and small wallabies or brush-kangaroos, some of which inhabit New Britain and New Guinea, as well as Australia. The rat-kangaroos (*Potorous* and related genera) are a small group of species somewhat resembling rats and rabbits in size and habits. They are nocturnal and obtain their food largely by digging roots. The genus *Dendrolagus* includes the arboreal tree-kangaroos. Fossil forms are exhumed from the Pleistocene rocks of Australia very similar to modern genera, but some of the older ones were much larger than any existing species. Consult: Thomas, ‹Catalogue of Marsupialia, and Monotremata in the British Museum›; Gould, ‹Monograph of the Macropodidæ,› and ‹Mammals of Australia,› and Aflalo, ‹Natural History of Australia.›

Kangaroo-rat, a small and pretty jerboa-like rodent of the southwestern United States. It has very long and strong hind legs, and runs by a series of leaps with great swiftness. It inhabits arid regions, dwells in extensive burrows of its own digging, and feeds mainly upon sunflower-seeds, great quantities of which are stored up for winter use, when the burrows are warmly furnished with grass. It belongs to the pocket-mouse family (*Heteromyidæ*) and is named *Perodipus ordi* by systematists. Consult: Stone and Cram, ‹American Animals› (1902).

Kangaroo-mice are smaller American rodents of the genus *Perognathus*. See POCKET-MICE.

Kankakee, kăn-kạ-kē′, Ill., city, county-seat of Kankakee County; on the Kankakee River, and on the Illinois C. and the Cleveland, C. C. & St. L. R.R.'s; about 133 miles northeast of Springfield and 56 miles south of Chicago. It was settled in 1850 and incorporated as a city in 1854. The water-power of the Kankakee River is extensive at Kankakee, and as a result the city is largely engaged in manufacturing. It is situated in an excellent agricultural region, and its good railroad facilities make it an important commercial centre for a large extent of country. The chief industrial establishments (1903) are agricultural implement works, in which are employed 600 men; piano factories, 250 men; furniture factories, 500; knitting works, 250; sewing machines, 300; and stone quarries, 250. Some of the other manufactures are starch, flour, wagons, bricks, tiles, nails, foundry products, mattresses, cigars, some dairy products. The churches are two Methodist Episcopal, one Presbyterian, four Roman Catholic, one Lutheran, one German Methodist, one Reformed Lutheran, one Seventh Day Adventist, and one Christian Science. The educational institutions are the public and parish schools, Saint Joseph's Seminary, a Conservatory of Music, and in Bourbonnais Grove, a suburb of the city, Saint Viateur's College, and Notre Dame Academy. It has the Illinois Eastern Hospital for Insane and the Emergency Hospital, a public library, the Y. M. C. A. building, and the city buildings. There are two national banks and two savings banks with a combined capital of $300,000. The government is vested in a mayor, who holds office two years, and a council of 10 members, one half of whom are elected each year. The council elects the administrative officials and the health and local improvement boards. Pop. (1890) 9,025; (1900) 13,595.

Kankakee, a river of northern Illinois, which has its rise in the northern part of Indiana, flows west and southwest and enters Kankakee County in Illinois. From where it receives the waters of the Iroquois from the south, the course changes to the northwest until it enters Grundy County, where it unites with the Des Plaines River and forms the Illinois.

Kano, kā-nō′, in the province of Sokoto, in West Africa, the chief town of the extensive Sudanese sultanate annexed by Great Britain in 1903. Kano is the point of convergence of many caravan routes and is the principal market and centre of trade in the interior of Africa. Leather and cotton goods are extensively manufactured and dyeing is carried on. On account of its industries Kano has been called the Manchester and Birmingham combined of the Dark Continent. The annual attendance of the market at Kano exceeds 1,000,000 persons from all parts of Africa; Morrell estimates the attendance as twice as large. The market is held daily throughout the year and is believed to have existed at this place for over 1,000 years. Sign language is largely used by the heterogeneous crowd in making bargains. In addition to native wares and produce, such as ivory and ostrich feathers, European merchandise and ammunition are on sale. The objectionable feature of the market is the trade in slaves, a characteristic that will doubtless disappear under British rule. The wall surrounding Kano is reported to be 16 miles in circumference. The houses are chiefly of adobe and the streets are wide and clean. Kano was captured by the British in 1903. Pop. (estimated 1892) 120,000. See also SOKOTO.

Kansas, one of the great States of the Middle West, the 21st to be admitted into the Union, and a centre of human activity and achievement from its beginning. In less than 50 years a vast commonwealth has been erected, exceeding in population and resources many of the older States. The historian, George Bancroft, designated Kansas as «the miracle of the age.» The name is derived from the Indian word «Kanza,» having the dual significance of «wind» and «swift.» In popular nomenclature Kansas is known as «the Sunflower State.» Its State motto is *Ad Astra per Aspera* — «through difficulties to the stars.» The State is situated in lat. 37° to 40° N., lon. 94° 40′ to 102° W.; bounded on the north by Nebraska, on the northeast and east by Missouri, on the south by Oklahoma and Indian Territories, and on the west by Colorado.

Early History.— The territory forming the present State of Kansas was a part of the Louisiana Purchase of 1803, except a fraction in the southwest corner acquired from Texas in 1850. It is claimed that Coronado visited the country as early as 1541, and there are evidences

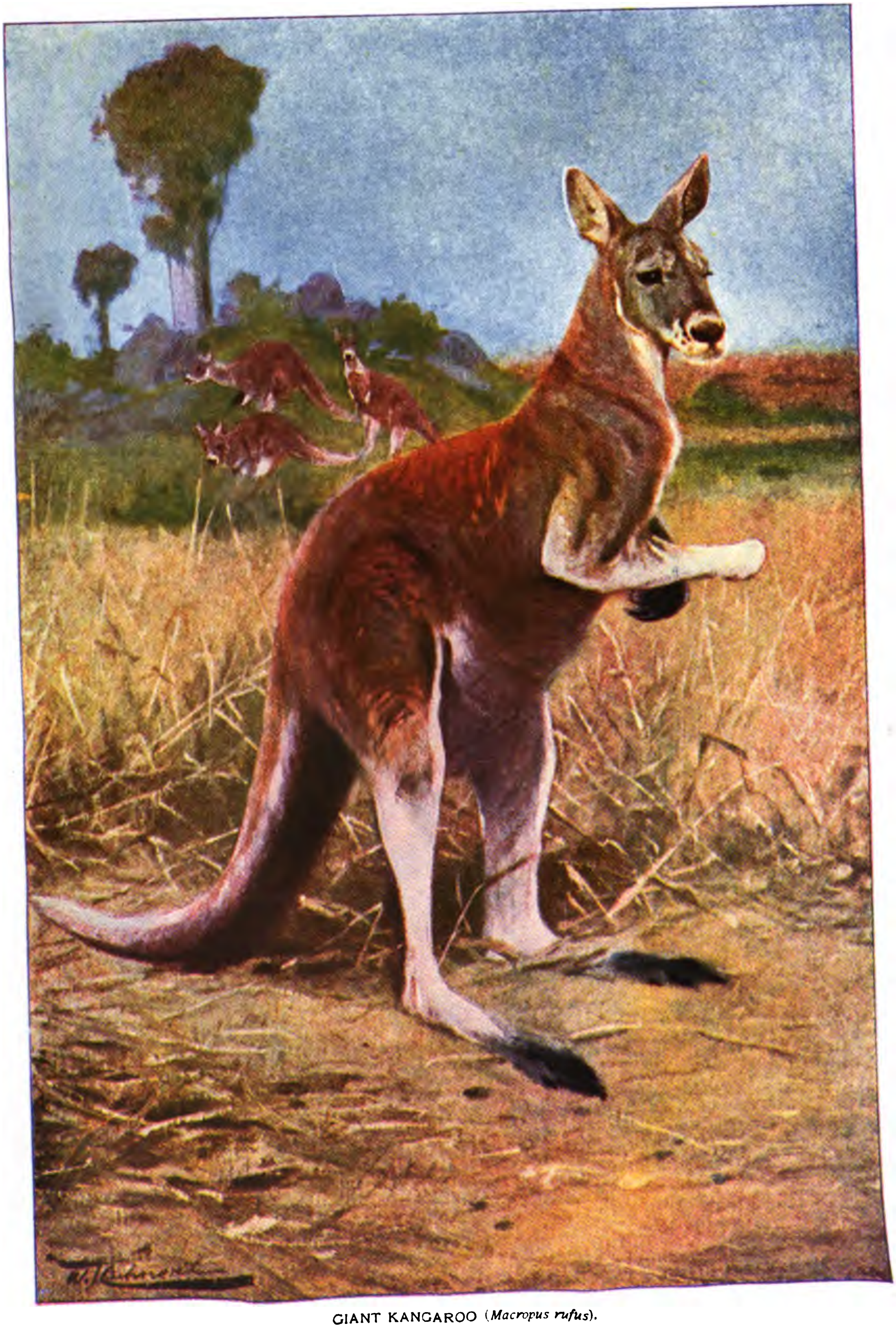
GIANT KANGAROO (M[illegible] rufa)

[illegible] to be [illegible] are chiefly [illegible]

[illegible] of the Mid-[illegible]

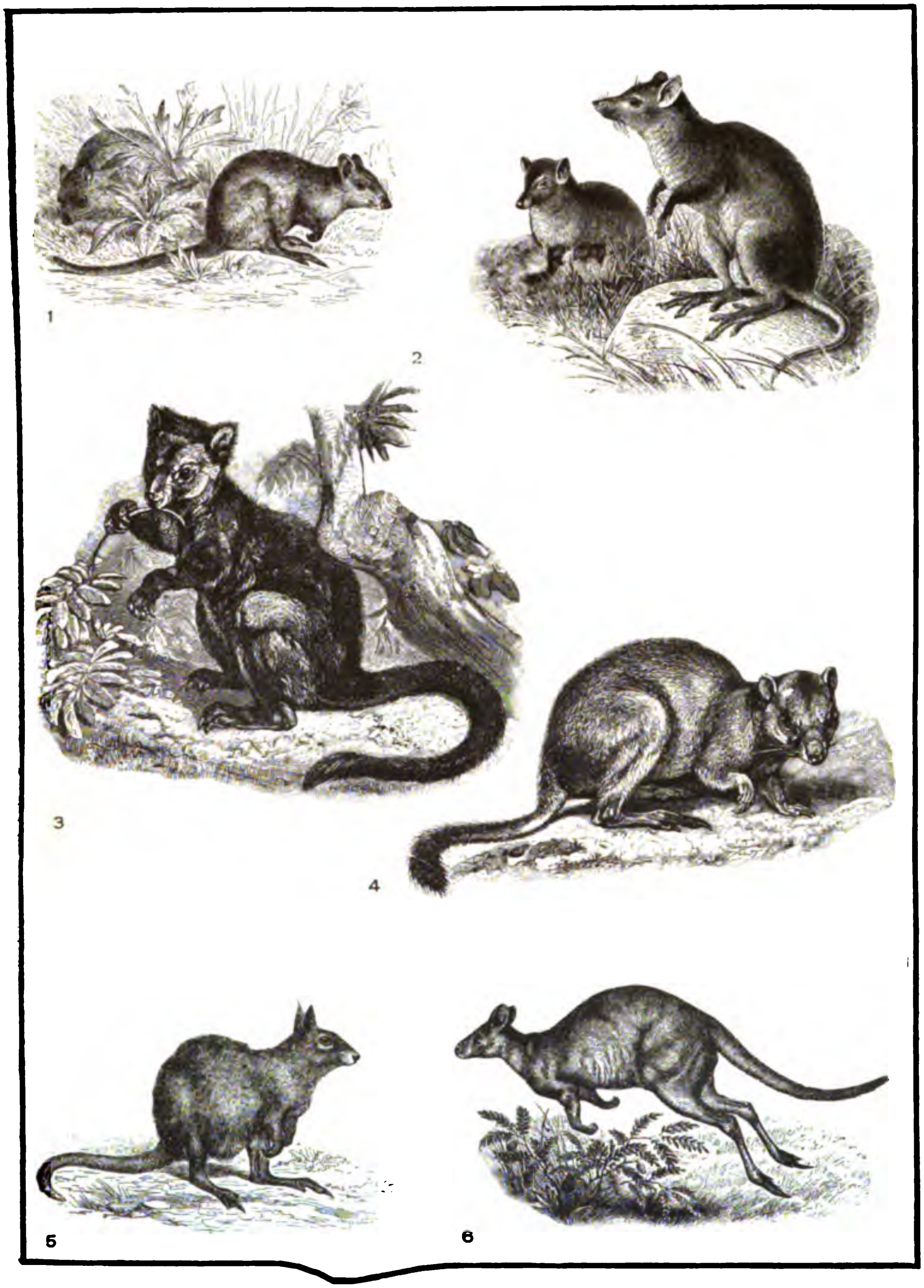
[illegible] George [illegible] "the miracle of the a[illegible]." The [illegible] from the Indian word "Kanza" [illegible] significance of "wind," and [illegible] popular nomenclature Kansas is [illegible] "the Sunflower State." Its State [illegible] is "*Ad astra per aspera*" — "through difficulties to the stars." The State [illegible] 37° to 4[illegible] lon. [illegible] 40 to 102 W.; bounded [illegible] Nebraska, on the north-east and [illegible] on the south by Oklahoma [illegible], and on the west by [illegible]

[illegible] territory forming the [illegible] was a part of the Louisiana [illegible] in the [illegible] Texas in 1850. [illegible] the country [illegible]



GIANT KANGAROO (*Macropus rufus*).

KANGAROOS.



1. Kangaroo Rat.
2. Hypsiprymnodon.
3. Tree Kangaroo.
4. Rock Kangaroo.
5. Hare Wallaby.
6. Pademelon Wallaby.

of French and Spanish expeditions in later years. The Lewis and Clark Expedition, planned by President Jefferson, reached Kansas in June 1804, and, two years later, the expedition commanded by Zebulon Montgomery Pike, who gave his name to «Pike's Peak,» crossed the territory from the Missouri River to the Rocky Mountains. The expedition of Major Stephen H. Long was made in 1819, and in 1824 was established the «Santa Fe Trail,» the famous highway of Kansas, extending 400 miles directly across the Territory, and from Independence, Mo., to Santa Fe, a distance of 780 miles.

This was the beginning of the development and growth of Kansas. The outposts of civilization were being extended westward from the Mississippi River. The Indians of Missouri and other Mississippi Valley States were concentrated with the tribes already occupying the country west of the Missouri River. These included the Osage, Shawnee, Pawnee, Delaware, Kickapoo, and Kansas tribes, to which were added the Cherokee and other tribes from the States of the south, the Ottawas, Pottawatamies, Wyandottes and others from Ohio, Michigan and Indiana. Kansas became Indian Territory, and remained such from 1830 to 1854. Occupation of the country by white settlers was fraught with peril and hardship, and only accomplished by marvelous heroism, perseverance and endurance. To aid in the work of civilization missions were established on the frontier, and military posts located at Fort Leavenworth, Fort Scott and Fort Riley.

Territorial Days.— The admission of Kansas as an organized Territory dates from 30 May 1854, when President Pierce signed the Kansas-Nebraska Act. This brought on what may be termed the political troubles of Kansas, and later, as a result of the slavery agitation, precipated the great armed conflict between the North and the South in 1861-5. It was on Kansas soil that the first battle was fought for the freedom of the negro, and it was Kansas that developed the heroic figure of John Brown. From the time Congress took the first step for the admission of Kansas, with or without slavery, the Territory became the scene of contention, pillage and bloodshed. The pro-slavery men of Missouri endeavored to gain control of the Territory in 1854, and established the first city, Leavenworth. Soon afterward an anti-slavery colony from Massachusetts settled at Lawrence. No more hostile factions ever struggled for supremacy on this continent.

Andrew H. Reeder, of Pennsylvania, was appointed to be the first governor of the Territory. At the first contest for territorial delegate to Congress the slavery men of Missouri crossed the river and participated in the election, the candidate of the pro-slavery party being successful by reason of these illegal votes. The Free-soilers protested and held indignation meetings at Lawrence and other points. The Missourians repeated the same tactics at the election in the spring of 1855 for representatives to the legislature. When the legislature met at Pawnee the pro-slavery members were in the majority, and controlled the proceedings, even to the extent of driving out the Free-soil members and changing the seat of government. The Free-soil party repudiated the acts of the legislature and refused to abide by them. Governor Reeder was removed from office and succeeded by Wilson Shannon, of Ohio. John W. Whitfield was elected delegate to Congress by the pro-slavery party, and Ex-Governor Reeder chosen to the same position by the opposition, but Congress refused to give either delegate a seat. A Free-soil constitution was adopted in December 1855, under which Charles Robinson was elected governor, but the election was repudiated by President Pierce, who had recognized the «bogus» legislature. The Free-soil legislature ignored the action of President Pierce, and, to meet this and other menacing circumstances, the military forces of the United States government were placed in command of Governor Shannon. Governor Robinson and Congressman-elect Reeder were indicted for high treason. The pro-slavery party received large accessions from Georgia, Alabama and South Carolina. In the troubles resulting from this conflict of authority the Emigrant Aid Society Hotel and the 'Herald of Freedom' and 'Kansas Free State' printing offices at Lawrence were destroyed, and the town of Osawatomie — the home of John Brown — was sacked and burned.

Struggles for Statehood.— A bill for the admission of Kansas as a State was passed by the lower house of Congress in June 1856, but was defeated in the Senate on account of the recognition it gave to the Free-soil constitution. A meeting of the Free-soil legislature in Topeka was dispersed by United States troops acting under orders from President Pierce. By this time the interest in the Kansas struggle became general throughout the United States. The suppression of slavery became a national instead of a state issue. While Congress debated and legislated, the pro-slavery and free-state factions continued to war against each other for possession of the Territory and control of the law-making machinery. Conflicting constitutions were adopted, rival legislatures elected, and civil government overthrown. Public meetings were held in all parts of the North to lend encouragement to the movement for making Kansas a free State. Similar sympathy and help came to the pro-slavery party from the States of the South. Horace Greeley and Abraham Lincoln visited the Territory, and made speeches in opposition to the further extension of slavery on American soil. Governor Shannon was removed from office, and the several governors appointed to succeed him found the duties of the position so onerous that they resigned in rapid succession.

After numerous battles, elections and vicissitudes, a constitutional convention was called to meet at Wyandotte 5 July 1859. It was composed of 35 Free-state and 17 pro-slavery delegates, who were now known as Republicans and Democrats, respectively. Under the constitution adopted by this convention slavery was prohibited and Kansas admitted as a State 29 Jan. 1861. The seat of government was located at Topeka. At the election held in December 1859, under the Wyandotte constitution, Charles Robinson was chosen to be the first governor of the State, and Martin F. Conway the first representative in Congress. When the first State legislature assembled at Topeka in March 1861 James H. Lane and Samuel C. Pomeroy were elected the first two United States senators from the new State.

In the civil war which followed the inauguration of President Lincoln in 1861, Kansas showed its loyalty to the Union by furnishing 20,000 trained soldiers out of a total population of but little more than 100,000 — a number greatly in excess of her quota, none of them drafted, and in proportion exceeding the enlistments from any other State. A large part of this force was employed in defending the borders of the State from invasion by southern troops, Indians and guerrillas. During one of these border raids a force of 400 men under command of Quantrell invaded Lawrence, burning and pillaging the town and killing 150 defenseless citizens. The war and the troubles with the Indians, together with a visitation of drought in 1860, greatly retarded the growth of Kansas, but when these obstacles were passed an era of progress and development set in which has never since abated. The splendid soil and auspicious climate and the general adaptability of the State to farming and stock-raising purposes have attracted thousands of settlers to the State, and the advancement in all lines has been rapid, substantial and permanent.

Governors—(*Territorial*) Andrew H. Reeder (1854 to 1855), Wilson Shannon (1855 to 1856), John W. Geary (1856 to 1857), Robert J. Walker (1857), James W. Denver (1858), Samuel Medary (1858 to 1860). (*State*) Charles Robinson (1861–3), Thomas Carney (1863–5), Samuel J. Crawford (1865–8), Nehemiah Green (1868), to fill the unexpired term of Samuel J. Crawford, resigned; James M. Harvey (1869–73), Thomas A. Osborn (1873–7), George T. Anthony (1877–9), John P. St. John (1879–83), George W. Glick (1883–5), John A. Martin (1885–9), Lyman U. Humphrey (1889–93), Lorenzo D. Lewelling (1893–5), Edmund N. Morrill (1895–7), John W. Leedy (1897–9), William E. Stanley (1899–1903), Willis J. Bailey (1903—). During the official interruptions incident to the territorial period the following persons served terms as acting governor: Daniel Woodson, Frederick P. Stanton, James W. Denver, Hugh S. Walsh, George M. Beebe.

United States Senators.— James H. Lane (1861–6), Samuel C. Pomeroy (1861–73), Edmund G. Ross (1866–71), Alexander Caldwell (1871–3), Robert Crozier (1873–4), James M. Harvey (1874–7), John J. Ingalls (1873–91), Preston B. Plumb (1877–91), William A. Peffer (1891–7), Bishop W. Perkins (1892–3), John Martin (1893–5), Lucien Baker (1895–01), William A. Harris (1897–03), Joseph R. Burton (1901), term expires 1907; Chester I. Long (1903), term expires 1909.

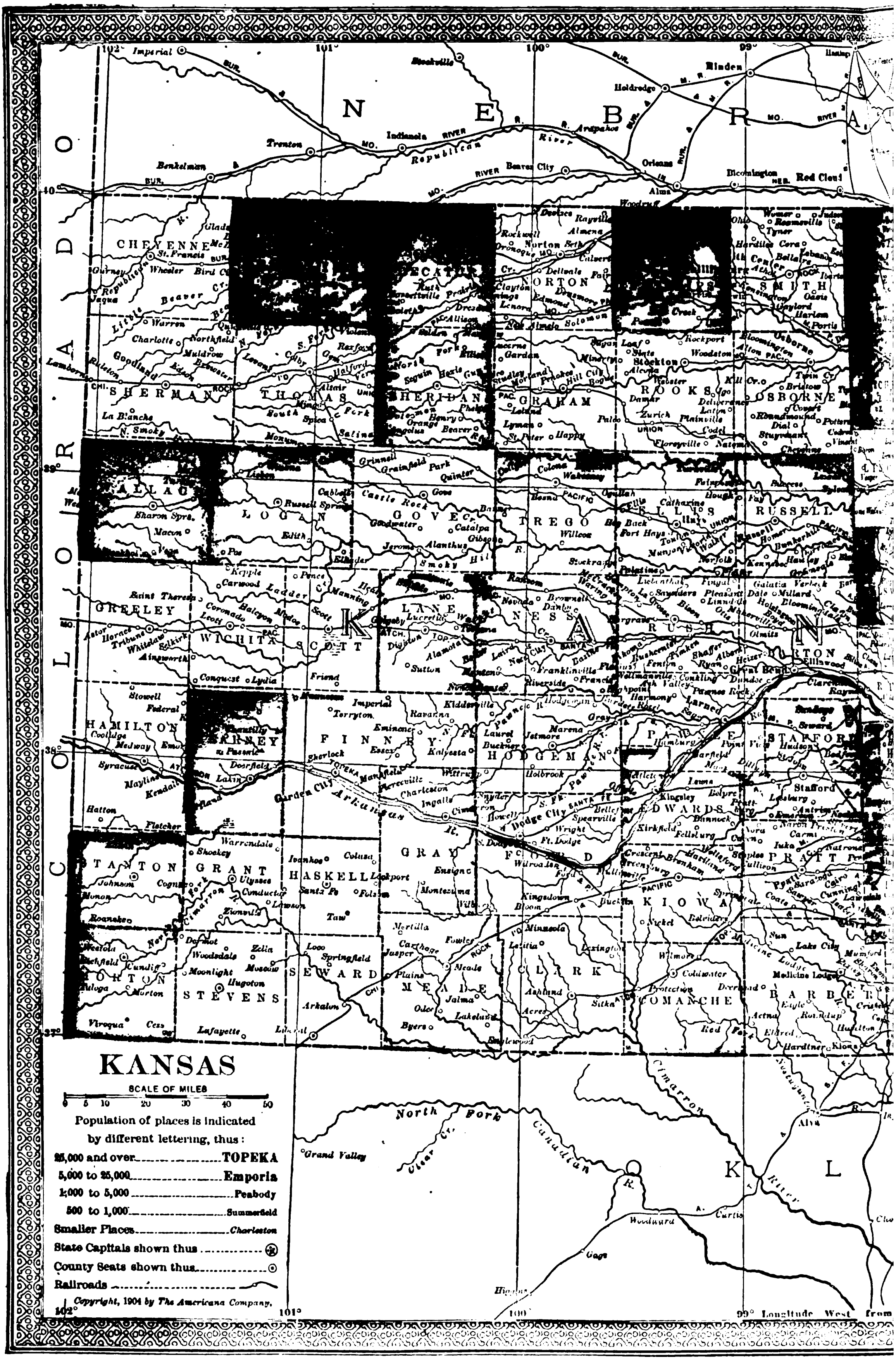
Government.— The State legislature consists of 40 senators and 125 representatives. Sessions are held biennially, in odd-numbered years. The legislature of 1903 was divided politically as follows: Senate, 34 Republicans, 6 Democrats and Populists; house, 95 Republicans, 30 Democrats and Populists; Republican majority on joint ballot, 129. The elective State officers include governor, lieutenant-governor, secretary of state, auditor, treasurer, attorney-general, State superintendent of public instruction, commissioner of insurance, 7 justices of the supreme court, and 3 members of the State board of railroad commissioners. Kansas has 8 representatives in the lower house of Congress, of which 7 are chosen by districts and 1 at large. Women have the right of suffrage at municipal, bond and school elections. They have been elected to municipal and school offices, and in some cases to county offices.

Population.— The local census of 1855 gave Kansas a population of 8,501; this increased in 1860 to 107,206; in 1870 to 364,399; in 1880 to 396,096; in 1890 to 1,427,096; in 1900 to 1,470,495. The present population of the State, according to the local census of 1903, is 1,487,847. Population by counties follows:

County	Pop.	County	Pop.
Allen	26,468	Linn	15,534
Anderson	13,630	Logan	2,127
Atchison	30,369	Lyon	25,944
Barber	6,698	Marion	21,455
Barton	13,518	Marshall	23,851
Bourbon	26,324	McPherson	20,772
Brown	20,921	Meade	1,592
Butler	22,269	Miami	20,254
Chase	7,434	Mitchell	13,034
Chautauqua	11,779	Montgomery	33,473
Cherokee	36,381	Morris	11,704
Cheyenne	2,709	Morton	246
Clark	1,734	Nemaha	20,258
Clay	15,317	Neosho	22,253
Cloud	17,453	Ness	4,976
Coffey	15,582	Norton	10,564
Comanche	1,671	Osage	22,371
Cowley	31,779	Osborne	11,283
Crawford	42,198	Ottawa	10,479
Decatur	8,521	Pawnee	5,706
Dickinson	22,235	Phillips	13,196
Doniphan	15,007	Pottawatomie	17,279
Douglas	25,400	Pratt	7,766
Edwards	4,797	Rawlins	5,040
Elk	10,504	Reno	29,142
Ellis	10,452	Republic	16,457
Ellsworth	9,059	Rice	13,746
Finney	3,273	Riley	13,738
Ford	6,531	Rooks	8,274
Franklin	21,593	Rush	6,470
Geary	10,843	Russell	8,377
Gove	2,870	Saline	18,249
Graham	6,119	Scott	1,320
Grant	394	Sedgwick	51,175
Gray	1,543	Seward	824
Greeley	575	Shawnee	57,060
Greenwood	16,037	Sheridan	4,083
Hamilton	1,517	Sherman	3,416
Harper	11,290	Smith	15,077
Harvey	17,594	Stafford	10,033
Haskell	504	Stanton	349
Hodgeman	2,518	Stevens	670
Jackson	15,598	Sumner	25,636
Jefferson	20,164	Thomas	3,916
Jewell	16,233	Trego	3,091
Johnson	16,840	Wabaunsee	12,391
Kearny	1,158	Wallace	1,073
Kingman	11,211	Washington	20,594
Kiowa	3,039	Wichita	1,229
Labette	29,183	Wilson	16,286
Lane	1,946	Woodson	10,072
Leavenworth	41,044	Wyandotte	74,267
Lincoln	9,849		

There are 118 cities and towns having a population of 1,000 or more. The 10 largest cities and their population are: Kansas City, 59,919; Topeka, 38,959; Wichita, 31,549; Leavenworth, 22,991; Atchison, 16,617; Fort Scott, 13,707; Pittsburg 13,116; Lawrence, 11,726; Hutchinson, 10,668; Parsons, 10,066.

Topography.— Although a part of the great plains which form the eastern slope of the Rocky Mountains, the physical character of the Kansas country is best described as rolling prairie. There are no mountains, and no marshes. The altitude varies from 750 feet in the eastern to 4,000 feet in the western part of the State. The bulk of the land is tillable, but crops are uncertain in the western third of the State on account of deficient rainfall. In this deficient area the vast stretches of prairie are largely used for grazing purposes. The rivers are the Kansas, Arkansas, Republican, Smoky



KANSAS

SCALE OF MILES

0 5 10 20 30 40 50

Population of places is indicated by different lettering, thus:

25,000 and over……………TOPEKA

5,000 to 25,000……………**Emporia**

1,000 to 5,000……………Peabody

500 to 1,000……………Summerfield

Smaller Places……………*Charleston*

State Capitals shown thus……………⊛

County Seats shown thus……………⊙

Railroads

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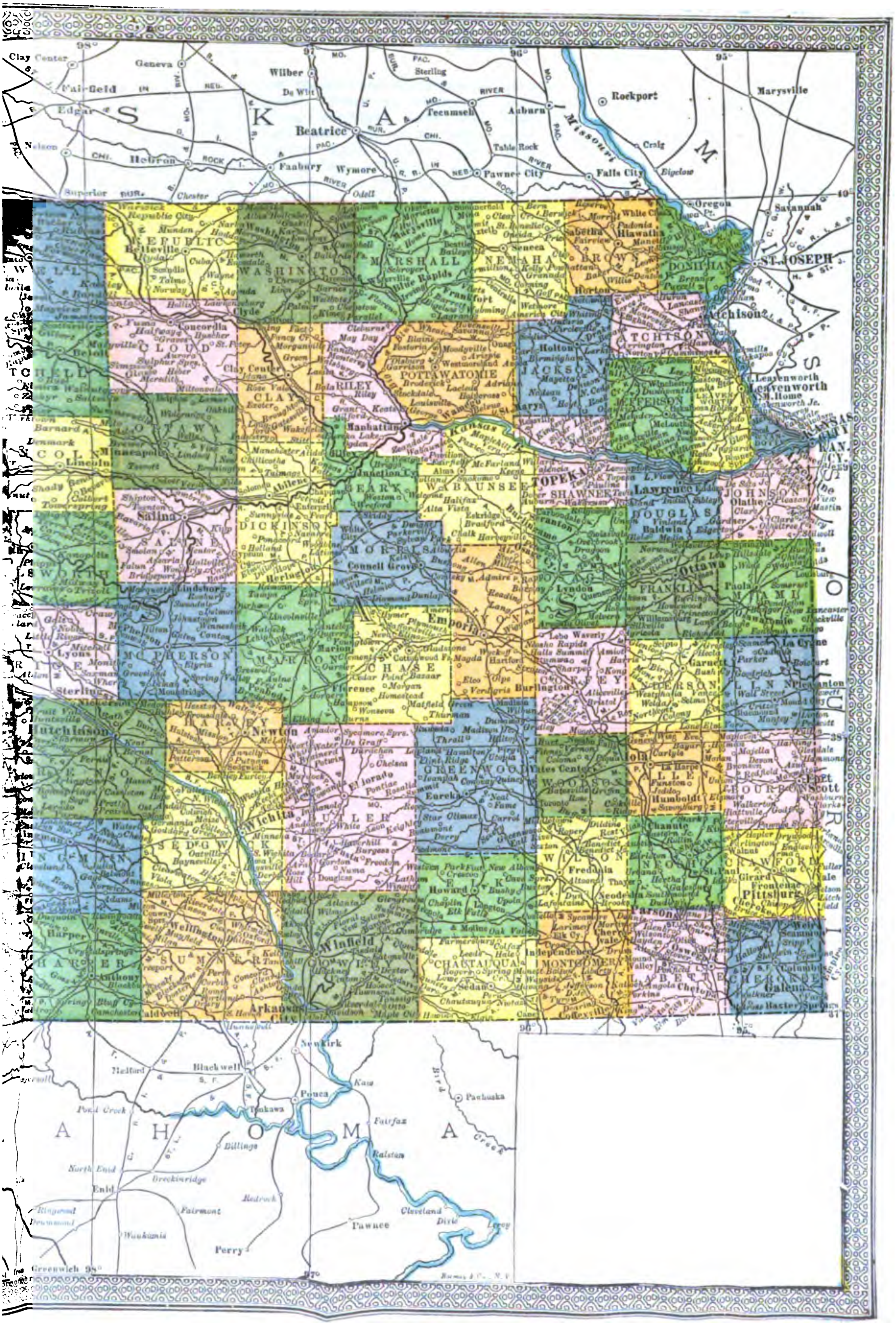

NEBRASKA
OKLAHOMA
MISSOURI
KANSAS
ST. JOSEPH
Atchison
Leavenworth
KANSAS CITY
TOPEKA
Lawrence
Manhattan
Abilene
Salina
Emporia
Newton
Hutchinson
Wichita
Winfield
Arkansas City
Wellington
Ottawa
Fort Scott
Pittsburg
Parsons
Independence
Coffeyville
Chanute
Iola
Beatrice
REPUBLIC
WASHINGTON
MARSHALL
NEMAHA
BROWN
DONIPHAN
CLOUD
CLAY
RILEY
POTTAWATOMIE
JACKSON
ATCHISON
JEFFERSON
LEAVENWORTH
OTTAWA
LINCOLN
SALINE
DICKINSON
GEARY
WABAUNSEE
SHAWNEE
DOUGLAS
JOHNSON
MORRIS
LYON
OSAGE
FRANKLIN
MIAMI
McPHERSON
MARION
CHASE
COFFEY
ANDERSON
LINN
HARVEY
RENO
BUTLER
GREENWOOD
WOODSON
ALLEN
BOURBON
SEDGWICK
KINGMAN
HARPER
SUMNER
COWLEY
ELK
CHAUTAUQUA
WILSON
NEOSHO
CRAWFORD
MONTGOMERY
LABETTE
CHEROKEE
Missouri River
Enid
Perry
Blackwell
Newkirk
Ponca
Pawnee
98°
97°
96°
95°
40°
39°
38°
37°

Hill, Solomon, Saline, Neosho and Verdigris — none of them navigable. There are numerous smaller streams, giving abundant water and drainage in the eastern two-thirds of the State. The land area comprises 82,080 square miles (52,531,200 acres), extending 408 miles from east to west, and 208 miles from north to south.

Climate.— The climate is mild, the great proportion of the days being fair and sunny. In summer the temperature ranges from 80° to 100°, with cool nights, and dry, pure air. In winter it rarely falls below zero. The violent winds of winter and spring, known to the early settlers, have been greatly mitigated by the cultivation of the soil and the planting of trees.

Agriculture and Stock-raising.— Fully 40 per cent (20,000,000 acres) of the farm land of Kansas is in a high state of cultivation. The cultivated farms have an aggregate value of $600,000,000. The acreage in field crops in 1902 was exceeded only by Iowa. The following table shows the acreage, quantities and values of farm products for the year 1902:

Crops	Acres	Quantities	Values
Winter wheat .....bu.	6,254,747	54,323,839	$28,983,943.60
Spring wheat .....bu.	46,293	325,397	155,546.57
Corn .....bu.	6,990,764	201,367,102	78,321,653.26
Oats .....bu.	1,023,171	32,966,114	9,564,254.35
Rye .....bu.	338,358	3,728,296	1,584,321.31
Barley .....bu.	154,665	2,188,973	801,381.69
Buckwheat .....bu.	387	2,770	2,216.00
Irish potatoes .....bu.	60,618	8,193,632	3,136,856.71
Sweet potatoes .....bu.	4,517	539,879	334,487.41
Castor-beans .....bu.	557	4,400	5,500.00
Cotton .....lbs.	486	136,005	9,520.35
Flax .....bu.	263,962	1,427,975	1,713,570.00
Hemp .....lbs.	51	10,200	610.00
Tobacco .....lbs.	98	15,150	1,515.00
Broom-corn .....lbs.	43,893	16,584,205	495,640.15
Millet and hungarian.....tons	174,933	400,160	1,445,415.00
Sorghum: For syrup or sugar.....gals.	20,411	1,792,200	663,114.00
For forage or grain.....	540,855	.....	3,159,584.00
Milo maize .....tons	5,839	16,514	56,166.00
Kafir-corn .....tons	748,176	2,824,624	9,495,572.00
Jerusalem corn .....tons	3,021	7,989	27,372.00
Timothy .....tons	319,836	803,934	4,823,604.00
Clover .....tons	109,172		
Blue-grass .....tons	268,873		
Alfalfa .....tons	458,493		
Orchard-grass .....tons	2,832		
Other tame grasses.....tons	91,038		
Prairie-grass under fence.....tons	7,953,809	820,637	3,282,548.00
Totals.....	25,879,855	.....	$148,064,391.40
Animals slaughtered or sold for slaughter.....		.....	$51,346,589.00
Pountry and eggs sold.....		.....	5,706,352.00
Wool clip ..... lbs.		647,427	97,114.05
Cheese ..... lbs.		3,025,655	302,565.50
Butter ..... lbs.		44,350,829	7,517,331.65
Milk sold		.....	725,380.00
Garden products marketed.....		.....	653,975.00
Horticultural products marketed.....		.....	1,187,473.00
Wood marketed		.....	186,150.00
Wine manufactured .....gals.		205,470	154,102.50
Honey and beeswax.....lbs.		450,389	60,631.20
Total.....		.....	$67,937,663.90
Total value all farm products.....		.....	$216,002,055.30

The numbers and values of live stock for the same year were: Horses, 811,594 — $51,130,422; mules and asses, 95,671 — $6,696,970; milch cows, 791,844 — $23,755,320; other cattle, 2,555,800 — $61,339,200; sheep, 136,753 — $410,259; swine, 1,427,302 — $11,775,241; total value, $155,107,412.

Kansas ranks well in the production of fruit and is surpassed by but few States in the growth of nursery stock. The number of apple trees in bearing in 1902 was 7,295,415; peach trees, 4,062,463; cherry trees, 852,268; plum trees, 641,977; pear trees, 247,515; number of acres in nurseries, small fruits and vineyards, 13,226.

Manufactures.— The natural material for manufacturing is limited. There are no timber lands of consequence, and no deposits of iron. Manufacturing, therefore, is confined to the conversion of farm products into marketable commodities, such as flour and meat, and these industries are important and extensive. Including the large plants at Kansas City, Kan., the slaughtering and meat packing business of the State for the year 1900 amounted in value to $77,411,883. The flouring and grist mill products for the same year aggregated a value of $21,926,768. Other manufacturing interests for the same year amounted to the following sums: Car construction and railroad shop work, $6,816,816; zinc smelting and refining, $5,790,144; foundry and machine shop products, $3,652,530. The total value of the products enumerated was $118,402,409, covering the work of 860 establishments and 18,288 employees.

Mineral Resources.— These consist principally of coal, zinc, lead, natural gas, petroleum, cement and gypsum. With the exception of the three last-named commodities the mining industry is chiefly located in the southeast corner of the State, embracing the counties of Cherokee, Crawford, Labette, Bourbon, Montgomery, Chautauqua, Neosho and Allen. Cherokee leads in coal, lead and zinc; Crawford is second in coal, Allen is first in natural gas, and Neosho first in petroleum. Extensive mines of coal are also found in Osage and Leavenworth counties. Reno and Kingman counties have the principal salt mines. Building stone of excellent quality is found in various parts of the State. Underlying the surface of Kansas are the three common formations known as the Carboniferous, Triassic and Cretaceous systems, running from north to south, and dividing the State into three belts of nearly equal extent. In the year 1900 the value of the mineral products of Kansas were: Coal, $5,516,534; zinc, $3,000,000; salt, $1,675,000; clay, $975,500; stone, $714,750; natural gas, $695,000; cement, $669,685; oil, $355,118; lead, $324,859; gypsum, $267,500; total, $14,193,946.

Railroads.— The total mileage of railway tracks operated in Kansas is 10,483. The prominent lines and systems are: Atchison, Topeka & Santa Fe; Chicago, Rock Island & Pacific; Union Pacific; Missouri Pacific; Missouri, Kansas & Texas; Saint Louis & San Francisco. The gross earnings of all Kansas railroads for the year 1902 were $28,000,000.

Banking.— There are 502 State and private banks in Kansas, with a total paid capital of $8,156,500, and deposits of $47,690,056.14. The 146 national banks have a paid capital of $9,936,400, and deposits of $50,973,729; making a total capital of $18,092,900, and total deposits of $98,663,785.14, these figures being for the year 1903. Of the total deposits it is estimated that 68 per cent is owned by farmers and stockmen.

Education.— Kansas spends more than $5,000,000 annually in the support of public schools. The school population is 500,000, the enrolment 390,000, and the average attendance 265,000. Number of teachers employed, 11,698. The percentage of illiteracy in the State is very low, being less than 3 per cent. The colleges in the State are: Baker University, Baldwin; Bethany, Lindsborg; Campbell University, Holton; Highland University, Highland; Kansas Wesleyan University, Salina; McPherson, McPherson; Midland, Atchison; Ottawa University, Ottawa; Southwest Kansas, Winfield; Saint Benedict's, Atchison; Saint John's, Salina; Saint Mary's, Saint Marys; State Agricultural, Manhattan; State Normal, Emporia; State University, Lawrence; Sisters of Bethany, Topeka; Washburn, Topeka.

Religion.— All of the religious denominations are represented, the Methodist being the largest numerically, followed in order by the Roman Catholic, Baptist, Disciples, Presbyterian, United Brethren, Congregational, Lutheran, Friends, African M. E., and Evangelical Association. The moral standard of the population is very high, Kansas being one of the few States that has adopted an amendment to its constitution prohibiting the manufacture and sale of liquor.

Newspapers and Libraries.— Kansas has 837 newspapers, including 51 dailies, 634 weeklies, 4 semi-weeklies, 116 monthlies, 14 semi-monthlies, 2 bi-monthlies, 11 quarterlies, and 5 occasionals. Of public, college and high school libraries there are 112, with a total of 525,519 volumes.

Charitable and Penal Institutions.— The institutions of this class, and the numbers of inmates of each, are: Insane asylum, Osawatomie (990); Insane asylum, Topeka (780); Insane asylum, Parsons (430); Blind asylum, Kansas City (93); Imbecile school, Winfield (210); Deaf and Dumb school, Olathe (263); Soldiers' Orphans' home, Atchison (150); Soldiers' home, Dodge City (146); State penitentiary, Lansing (1,020); Industrial reformatory, Hutchinson (260); Industrial school, girls, Beloit (125); Reform school, boys, Topeka (209). The Federal government maintains a military prison and a branch of the national soldiers' home at Leavenworth.

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James L. King,
Kansas State Librarian.

Kansas, a river in the State of Kansas, formed in Geary County by the junction of the Smoky Hill and Republican rivers. The direction of its course is mainly east; but it makes one gradual curve toward the north between Junction City, at the source, and Topeka. After a course of about 250 miles through a rich agricultural region, the river flows into the Missouri at Kansas City. The largest tributary is the Little Blue River from the north. Several small tributaries enter the Kansas from the south.

Kansas, University of, a State educational institution, situated at Lawrence, Kan. The establishment of a State university was provided for in the State constitution, and an act of the legislature incorporated the university in 1863. In 1865 a preparatory department was opened, and in 1866 one building was erected and the collegiate department established; in 1891 the preparatory department was discontinued. The present organization includes the school of arts, with classical and literary courses leading to the degree of A.B.; the school of engineering conferring the degree of B.S.; the graduate school giving advanced courses in arts and engineering; the school of law; the school of fine arts, offering courses in music, painting and elocution; the school of pharmacy; the school of medicine, offering the first two years of a regular four year medical course; and the summer session of six weeks. The university is the head of the State's public school system, and is in

KANSAS.

CAPITOL AT TOPEKA.

direct connection with the high schools, admitting those who have completed the high school course, or a similar course, without examination; no tuition is charged to residents of Kansas, and the university is open to both men and women; non-residents pay a small fee. The library in 1903 contained 40,840 volumes and a large number of pamphlets; $7,000 are annually appropriated for the purchase of books; the natural history museum contains over 250,000 specimens. In 1903 the State appropriated $50,000 for a building for the law school. Number of students (1903) 1,294; number of professors and instructors, 81.

Kansas City, Kan., city, county-seat of Wyandotte County; on the Kansas and Missouri rivers, and on the Union P., the Missouri P., the Chicago R. I. & P., the Chicago G. W., and the Atchison, T. & S. F. R.R.'s. Branches of other railroads enter the city and the nearby towns are connected by electric-trolley lines. Kansas City, Mo., opposite and east is one with Kansas City, Kan., in commercial development, but each has an independent municipal organization. A large number of bridges connect the two cities. In one part of the city, east of the Kansas River and south of the Missouri, the dividing line between the two cities is a street.

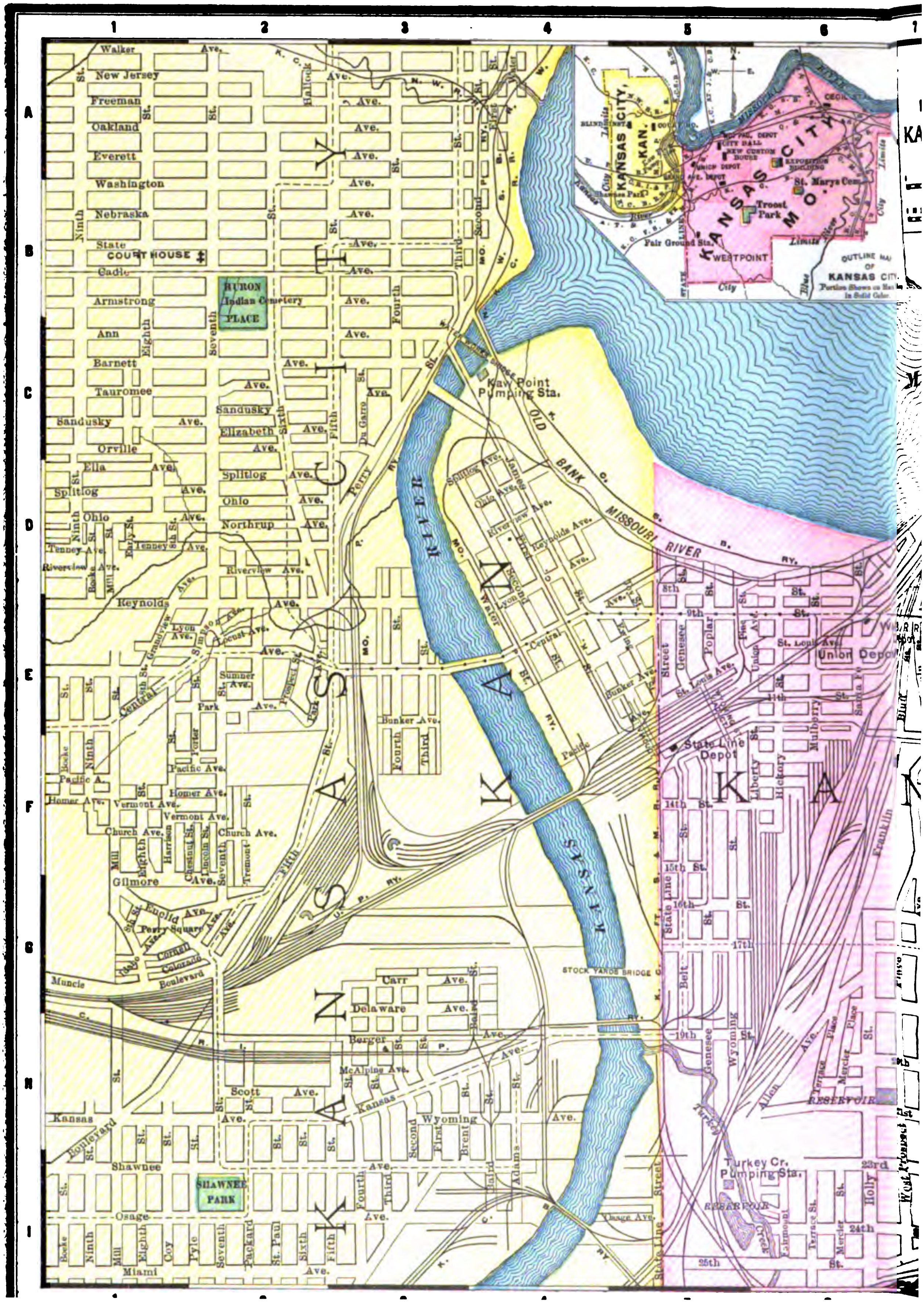
Kansas City is the largest city (1904) in the State. It was formerly known as Wyandotte, later as Kansas City, Kan., then, in 1886 the municipalities of Armourdale, Armstrong, Wyandotte, and Kansas City, united under the name of Kansas City. The area is 10½ square miles. A portion of the city is built on the river bottoms, and many fine public and private buildings are on the high bluffs and extend back on the level land. The city is on both sides of the Kansas River, so the boundary line between the States of Missouri and Kansas is in part the boundary line between the twin cities. It is noted for its live-stock and meat-packing industries; but the second largest live-stock-interest establishments in the country are on the boundary dividing the two cities. Some of its other chief industrial establishments are railroad car shops, machine shops, grain elevators, smelters, iron and steel works, flour mills, soap and candle factories, box and barrel factories, foundries, wholesale grocery houses, slaughter yards, lumber and brick yards. The slaughtering and meat packing industries have a capital of $15,000,000. In the State, in 1902, the value of the meat packing industries was $77,411,883, nearly all of which was the output of the Kansas City establishments. The manufacturing products of the city represented, in 1902, about $85,000,000. The city is the seat of Kansas City University, established in 1896 by the Methodist-Protestants; the State Institution for the Blind; College of Medicine and Surgery; Saint Margaret's and Bethany hospitals; and Carnegie Library. It has fine public parks, a magnificent high school and excellent public and parish schools. In August 1902 the city was visited by a severe storm and over 200 houses were destroyed, and a large number of public and private buildings were injured. Pop. (1890) 38,316; (1900) 51,418.

Kansas City, Mo., the second city in the State of Missouri and the 22d in population in the United States, it is located in the northwestern part of Jackson County in the angle formed by the Kansas River at its junction with the Missouri. At the intersection of 14th and Washington streets, the latitude is 39° north and the longitude is 94° 36′ 16.18″ west. The name is derived from an Indian tribe that formerly occupied and owned much of this section of the country and their title to which was extinguished in 1808, excepting a narrow strip of land 24 miles wide lying eastward of the State line from Fort Clarke, later known as Fort Osage, and extending southward to the Arkansas River. The Indians relinquished their title to this strip of land in 1825, and in it lies nearly all of Jackson County.

History.—Trading posts had been established at different points along the Missouri River from 1765 to 1799 as far upward as what is now St. Joseph, by the adventurous French trappers and traders who first explored much of this western country. The settlers who had been checked at the eastern limit of the Kansas Indian Reservation made a general rush into the newly acquired purchase. In 1826 a census was taken with the view of forming a county organization which was effected 15 December in the same year. Prior to this date, however, Daniel Morgan Boone, third son of Col. Daniel Boone, the noted pioneer, came from Kentucky in 1787 to St. Louis, where he made his home for 12 years, residing there during the summers, but in winters hunting and trapping beaver chiefly on the Big and Little Blue, in Jackson County, which he declared to be the best beaver country known. However, it was reserved for Lewis and Clarke to give the first distinct account of the country at the mouth of the Kansas River and this record made by them, is dated 26 June 1804. In 1800 Louis Barthelot, known in the early history as Grand Louis, moved from St. Charles, Mo., and settled at the mouth of the Kansas River; his wife being the first white woman to have a home on the present site of Kansas City. In 1821, Francis Chouteau established a camp opposite Randolph Bluffs. A flood in 1826 destroyed his trading post where he had made the first permanent white settlement within the corporate limits of Kansas City. These settlers were trappers, traders, laborers, and voyagers with their families. What is now the busiest part of Kansas City was called at first Westport Landing. The town of Westport was platted in 1833, and lies about four miles south of the landing on the Missouri River. Kansas City proper, that is, 250 acres of land, was laid out in town blocks and lots in 1838, but owing to a disagreement among the stockholders the project was abandoned till 1846, when a new company was formed who advertised and sold 150 lots. The town began to grow and soon had 600 inhabitants. At this time the chief agency in building up the new town was the trade with the Indians and with New Mexico. Within the short space of five years the town enjoyed almost exclusively the entire trade of New Mexico that came east to the Missouri River. This traffic was along what was known as the “Santa Fe Trail” (q.v.), a highway, extending at first from Franklin, Mo., on the Missouri River, to Sante Fe, New Mexico. Outside of these French settlers who had established themselves in the vicinity of what is now Kansas City, was James H. McGee, who came here in 1828, and whose family was prominently identified with the early history and development of this part of Missouri. There was not a sufficient infusion of the American spirit, however, for a number of years materially to affect the character of the early French traders who gave their attention to the extensive fur trade with the Indians as far west as the Rocky Mountains. Prior to 1828, the only means of crossing the Missouri River at this point was by canoes, but this year a ferry was established, so that the few settlers could cross the river to take their corn to a horse-mill on the north side of the river.

Topography.— The original site of Kansas City presented a rugged, precipitous and uninviting aspect,— high bluffs composed chiefly of limestone, facing the Kansas River as it sweeps in from the southwest, thence veering west of north till it empties into the Missouri River,— thence continuing along the south bank of the Missouri River four miles to the valley of the Big Blue. Through these high bluffs cut by deep ravines, in some places 200 feet deep, ran streams into the river. These gorges were the channels through which the water that fell on the upland, flowed into the Missouri. Towering upward from the two rivers, stood the precipitous bluffs with but a few hundred feet in width of bottom land on which to begin a city. Just below where the Kansas River empties into the Missouri, the bluffs for a mile or more were composed chiefly of a rich loam which has been shaved down to a moderate grade and the dirt made into brick. Owing to the changeable nature of the Missouri River in cutting through the bottom land on either side of it, the town had to be built between the river and the bluffs, along the deep ravines, and on the hills. Persons who see the city as it is now, can scarcely realize the obstructions that had to be removed in grading down streets to a level and in filling cuts. The city is topographically divided into three parts, known locally as the Hills, including all that part of the town on the highlands, extending east and south into level upland which is of great beauty; West Kansas City, including the lowlands lying between the State line on the west and the east bluff of the Kansas River, and the East Bottom which takes in all the lowland lying east of the foot of Grand Avenue where it runs to the Missouri River, were originally covered with dense forests, as indeed was the entire town site, and it was not till after the Civil War that the timber was cut off the West Bottom; since then it has become the busiest part of Kansas City in which are located the stock yards, elevators, the most of the passenger and local freight depots, and a large part of the wholesale business houses of the city. From its earliest history as Westport Landing, Kansas City was noted for its steamboat traffic. It had one of the most permanent landings on the river, — a rocky bank with a deep current in front of it. Here were landed the goods for the Mexican and Indian trade West and Southwest, and in exchange were received the wool, furs, buffalo robes, and other articles for the eastern markets. The location of the city at the most southern bend eastward in the Missouri River, even before the age of continental railroads, was the natural route through which the Sante Fe and the Indian trade of the West and Southwest must pass to be exchanged for the products these people desired.

Commerce.— The men who have contributed so much toward making Kansas City the metropolis of the Missouri Valley turned their attention to the grain and produce market of this vast region thirty years ago. From an insignificant local trade in 1871 of a few hundred thousand bushels of grain handled that year, the business has grown now to 50,000,000 bushels annually. In 1902 there were received 24,018,400 bushels of wheat, 16,092,800 bushels of corn, 8,358,000 bushels of oats, 376,800 bushels of rye, 33,000 bushels of barley, 99,200 bushels of flaxseed, 15,060 tons of bran, and 146,320 tons of hay, while the export of grain was 36,206,400 bushels. In the elevators and mills the storage capacity is 6,320,000 bushels, and the handling capacity,— 1,518,000 bushels, while the total mill products aggregate 1,692,854 barrels. The numerous grain elevators enable the railroads to handle and transport grain to other points with facility and despatch. Its title as the «greatest winter wheat market», is known in foreign countries to which millions of bushels of Kansas, Nebraska, Missouri, and Oklahoma grain are annually shipped by Kansas City exporters. It is not alone as a centre for the accumulation of wheat, corn, and oats that it is famous, but also as a distributing point for cereals to be consumed in the south, east, and in foreign markets. The flour and meal manufactured by the half dozen local mills also go abroad in large quantities, as well as to many parts of the United States. The milling business is one of the rapidly growing industries. Enormous capital is involved in the transaction of the grain business. In elevators alone the investments run into millions of dollars. The growth of this market since its inception in 1871 has been marked by a uniform and rapid progress until it is one of the most important grain markets in the United States. Kansas City's bank clearings are more than $1,000,000,000 annually, and the deposits exceed $70,000,000 in 19 different banks, having a paid up capital of $6,000,000. At present Kansas City occupies the second position in the world as the leading live stock market. The stock yards are the most convenient for the quick and safe handling of stock in the United States. The aggregate value of live stock handled last year was $126,250,000. The packing-houses are eight in number, having a combined capacity for daily slaughter of 12,300 cattle, 34,500 hogs, and 14,200 sheep. These products are marketed in every civilized country. The stock yards cover 200 acres, containing 1,200 cattle pens, 625 hog pens, and 300 sheep pens. The receipts of cattle at the stock yards for 1902 were 2,279,166; hogs 2.279,337; sheep 1,154,084; horses and mules 76,844; shipped in 117,730 cars. The cost of the packing plants is estimated at $12,000,000, and the number of hands employed approximates 12,000; while the annual value of the output is over $150,000,000. In 1902 the wholesale trade of Kansas City exceeded $100,000,000, and the retail trade $45,000,000. Seventy firms did a business of $16,000,000 in agricultural implements. The geographical location of Kansas City with respect to other centres of trade is represented as follows: — distance to St. Louis 273 miles, Chicago 428 miles, Cincinnati 614 miles, Omaha 205 miles, St. Joseph 63 miles, St. Paul 515 miles, Minneapolis 518 miles, Albany 1,267 miles, Buffalo 981 miles, Boston


KANSAS CITY
KANSAS
KANSAS RIVER
MISSOURI RIVER
COURT HOUSE
HURON PLACE Indian Cemetery
SHAWNEE PARK
Kaw Point Pumping Sta.
State Line Depot
Union Depot
STOCK YARDS BRIDGE
Turkey Cr. Pumping Sta.
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New Jersey
Freeman
Oakland
Everett
Washington
Nebraska
State
Cadle
Armstrong
Ann
Barnett
Tauromee
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Orville
Ella Ave.
Splitlog
Ohio
Northrup Ave.
Tenney Ave.
Riverview Ave.
Reynolds
Central
Pacific Ave.
Homer Ave.
Vermont Ave.
Church Ave.
Gilmore Ave.
Euclid Ave.
Perry Square
Muncie Boulevard
Carr Ave.
Delaware Ave.
Berger Ave.
McAlpine Ave.
Scott Ave.
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West Prospect
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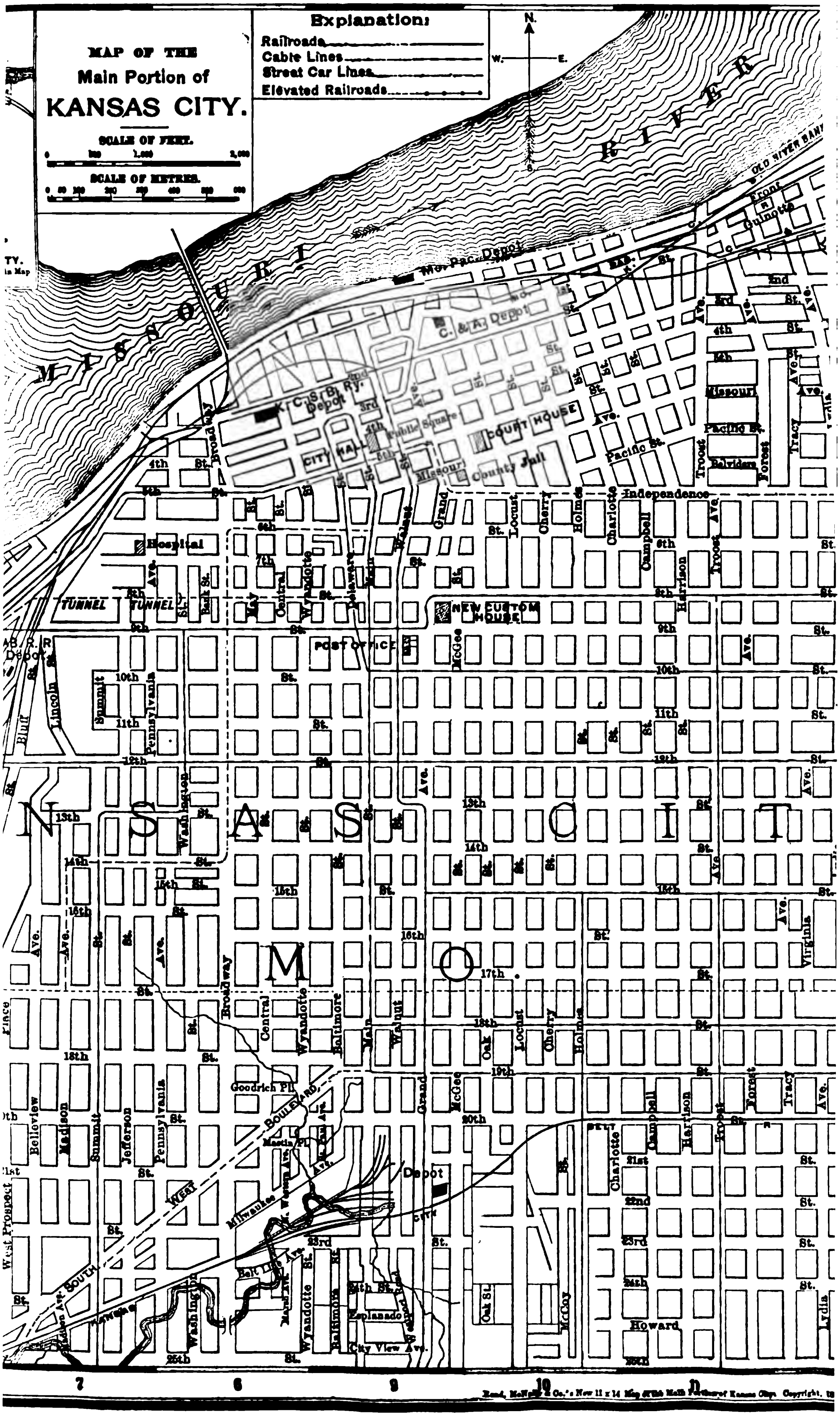
A B C D E F G H I
OUTLINE MAP OF KANSAS CITY. Portion Shown on Map in Solid Color.
KANSAS CITY, KAN.
KANSAS CITY, MO.
WESTPOINT
Troost Park
St. Marys Cem.
Fair Ground Sta.
CITY HALL
NEW CUSTOM HOUSE
UNION DEPOT
EXPOSITION BUILDING
Shawnee Park
City Limits
MISSOURI RIVER
Blue River


MAP OF THE
Main Portion of
KANSAS CITY.
SCALE OF FEET.
SCALE OF METRES.
Explanation:
Railroads
Cable Lines
Street Car Lines
Elevated Railroads
N.
W.
E.
MISSOURI RIVER
OLD RIVER BANK
Mo. Pac. Depot
C. & A. Depot
K. C. S. B. Ry. Depot
Public Square
COURT HOUSE
CITY HALL
County Jail
Hospital
TUNNEL
NEW CUSTOM HOUSE
POST OFFICE
Depot
Front
Guinotte
Independence
Broadway
Delaware
Main
Walnut
Grand
McGee
Oak
Locust
Cherry
Holmes
Charlotte
Campbell
Harrison
Troost
Forest
Tracy
Virginia
Lydia
Missouri
Pacific St.
Belvidere
Bluff
Lincoln
Summit
Pennsylvania
Washington
Central
Wyandotte
Baltimore
May
Bellevue
Madison
Jefferson
West Prospect
Goodrich Pl.
Mastin Pl.
BOULEVARD
WEST
SOUTH
Milwaukee
Belt Line Ave.
Esplanade
City View Ave.
Oak St.
McCoy
Howard
BELT
KANSAS CITY
MO.
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Rand, McNally & Co.'s New 11 x 14 Map of the Main Portion of Kansas City. Copyright, 18

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1,459 miles, New York 1,303 miles, Philadelphia 1,213 miles, Washington 1,267 miles, Pittsburg 896 miles, Atlanta 902 miles, Galveston 962 miles, New Orleans 942 miles, Denver 633 miles, Los Angeles 1,805 miles, San Francisco 2,093 miles, Portland, Ore., 2,050 miles.

Railroads.— Twenty different railroad systems enter the city, operating 33 different lines, representing more than 50,000 miles in length. The magnitude of this business may be inferred from the fact that 200 passenger trains arrive and depart daily from the depots, while 350 freight trains come into and go out of the freight yards, thus rendering Kansas City one of the greatest and most important transfer and distributing points on the continent, as well as one of the greatest express centres. Two railroad bridges span the Missouri River and a third is in process of construction. In telegraphic communication Kansas City is only surpassed by New York and Chicago in the number of wires entering the city and in the volume of business transacted.

Manufactures.— It has only been of recent years that manufacturing industries have sprung up along various lines in Kansas City. The energies of the business men were directed for two decades after the close of the Civil War to the live stock and agricultural trade, and in supplying the farmers with agricultural implements. Owing to the great deposits of bituminous coal in this vicinity and the abundance of raw material out of which so many products can be economically and rapidly manufactured, new industries are springing up each year. There are more than 600 factories in operation, employing 30,000 hands, who make $200,000,000 worth of merchandise annually. The minor manufactures represent an invested capital of $26,437,307, and output of $36,527,392, employing more than 16,000 persons.

Government.— At the head of the city government is the mayor, whose term of service is two years, upper house of aldermen, consisting of 14 members, whose term of service is four years, elected at large; lower house councilmen, 14 members, term of service two years; city treasurer, auditor, police judge, and city attorney, elected biennially. The other officers are nominated by the mayor and confirmed by the upper house. The board of park commissioners, the chief of the fire department, engineer, city physician, superintendent of buildings, superintendent of streets, plumbing inspector, superintendent of workhouse, etc., are appointed by the mayor and confirmed by the upper house. The board of police commissioners is composed of three members, the mayor, and two citizens appointed by the governor.

Public Service.— The assessed valuation of property is $93,260,070, an increase of more than $30,000,000 since 1893, and this valuation represents about one fourth of the cash value. The municipal indebtedness of the city is $5,331,-900.00, the greater part of which is for the waterworks plant. The city is also the owner of much valuable property, including the city hall, hospital, the workhouse grounds, and parks. The comptroller's last report shows the expenditures for operating expenses of the several departments: Officers and employees, $99,000.00; police department, $280,000.00; fire and fire patrol, $249,000.00; hospital and board of health, $35,000.00; workhouse, $17,000.00; printing and stationery, $18,000.00; board of public works, $200,000.00; gas and street lighting, $100,000.00; parks, $48,000.00; garbage, $20,000.00; expense, $56,000.00; water department, $453,409.00. The city purchased the waterworks in 1895. The water used is obtained from the Missouri River at Quindaro, a pumping station eight miles up the river. During 1902 there were 19 miles, 1,667 feet of water mains laid, and 283 fire hydrants placed. The street railway service, which permeates all parts of the city, connects with suburban trolley lines, reaching Independence, Leavenworth and intermediate stations, and affords a means of rapid transit for a quarter of a million of people at a nominal expense. The revenue to support the municipal government is derived from taxes levied annually on personal and real property, and the annual tax levy is about 12½ miles on the dollar's valuation. The city has an area of 26.3 square miles, with 452 miles of streets, of which 117.55 miles are paved with asphalt, 39.65 miles with vitrified brick, 2.24 miles with stone blocks, and 39.17 miles with macadam.

Population.— The following figures show the steady progress with which year by year Kansas City has advanced to her proud position as the largest and most important city in the Missouri Valley. The population in 1838 was 300; (1846), 700; (1857), 2,000; (1860), 4,418; (1870), 32,260; (1880), 55,785; (1890), 132,716; (1900), 163,750. The death rate is exceedingly low, being 12.84 of every 1,000 inhabitants.

Religion.—In 1825 the Jesuit fathers organized a mission near the mouth of the Kansas River, and built a small log house near the foot of what is now Troost Avenue, just below the bluff, where they worshipped for several years. Father Roux came in 1830 and took charge of the congregation, and five years later he purchased from a Canadian Frenchman a tract of 40 acres upon the hill adjoining the present site of the Roman Catholic cathedral and the bishop's residence. A part of this tract was cleared of the heavy timber, and a log church was erected, and here the congregation, composed chiefly of French-Canadians and half-breeds, scattered over more than 400 square miles, worshipped for 20 years. As soon as the Indian land was purchased settlers poured into it from the settlements east of it. Other religious denominations came till at the present time the number of churches in Kansas City is 180. The following will show the number of religious organizations: Baptist (32), Christians (15), Christian Scientist (3), Congregational (10), Episcopal (8), Evangelical (4), Hebrew (4), Lutheran (4), Methodist Episcopal (25), Methodist Episcopal South (8), Presbyterians (16), Reformed (1), Roman Catholic (20), Universalists (3), Unitarians (1), miscellaneous (23).

Public Schools.— The present public school system was organized 1 Aug. 1867, and in October of that year the schools were formally opened in rented rooms which had been hastily and scantily furnished. Bonds were issued, sites were purchased, and school houses erected. Sixteen teachers were employed during the first year, and about 1,200 pupils were enrolled. From this small beginning the school district has been enlarged till there are 52 different public school buildings, including sites valued at $3,347,390, with an enrolment of 29,591 pupils, of whom 3,700 are in the four high schools, being the largest per cent of high school pupils in any city in the United States having a population of more than 100,000 inhabitants. There are 718 teachers employed in the public schools. The public library, in which there are 43 persons employed, is also under the control of the board of education. In addition to the public school system, there are 60 other schools of various kinds, including private and parochial schools, medical and dental colleges, commercial schools, a school of oratory, fine arts, and an excellent school of law. Politics has been kept out of the city schools, and this is due largely to the plan suggested in 1876, when Superintendent Greenwood proposed that a non-partisan board composed of three Republicans and three Democrats be elected, and the board has been thus kept ever since. There are 850 persons employed in various capacities in the public schools and the public library, and the cost of operating the schools and public library is $663,979.52. It is a noteworthy fact that since the organization of the board of education 36 years ago with six men serving all the time, only 29 different men have composed its membership. Two members are elected every two years, and the term of service is six years. Kansas City was the first city in the United States to make its school board non-partisan.

Parks and Cemeteries.— The city has spent nearly $6,000,000 for its parks, which contain 2,089.9 acres, divided into six park districts: The North Park District, 219.39 acres; South Park District, 148.40 acres; West Park District, 165.07 acres; East Park District, 66.24 acres; Westport District 136.80 acres; Swope Park District, 1,354.00 acres. The system is divided into 19 different parks, nearly all of which are connected by an extensive system of 15 boulevards in connection with parkways, speedways, and pleasure resorts. Located in different parts of the city and easy of access are eight cemeteries, the largest of which are Union, Elmwood, St. Mary's and Forest Hill.

Public Buildings.— Among the public buildings are Convention Hall, which will seat 25,000 persons; city hall, county court-house, post-office, public library, Board of Trade building, New York Life building, Central high school, and the Manual Training high school, four large theatres, and also libraries and reading rooms. The public library, art gallery and museum, located at Ninth and Locust Streets, cost $250,000, and is under the management of the board of education. There are 90,000 volumes in the library, paintings in the art gallery of the value of $200,000, and a rare collection of natural history specimens in the museum, especially rich in Indian curios. There are 30 hospitals, asylums and homes. A large per cent of the citizens own their own homes, which adds to the civic pride and the material prosperity of the city.

Bibliography.— Case, 'History of Kansas City' (1888); Miller, 'History of Kansas City' (1881).

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Kansas-Nebraska Bill, a bill passed by Congress in 1854; the last of three compromises between the aggressive slavery expansionists of the South and their antislavery opponents in the North. It is famous because, by its repeal of the first, the Missouri Compromise (q.v.), it precipitated the organization and rapid growth of the Republican party, and especially incited the radical abolition sentiment of the North to aggressive action, thus causing or hastening the secession of the Southern States and the resulting Civil War. Its passage was mainly due to the leadership of Stephen A. Douglas (q.v.), of Illinois. The second compromise occurred when New Mexico and Utah came to be organized as Territories in 1850. The compromise consisted of the provision, which was also one of the two principal features of the Kansas-Nebraska Bill, that when these Territories came to be admitted as States they should come in with or without slavery as their constitutions, which would be framed by the people, might prescribe. The strengthening of the fugitive-slave law was the other feature of this compromise. This settlement of 1850 was the first step toward the final compromise, the Kansas-Nebraska Bill.

As early as 1844 Stephen A. Douglas introduced in the House of Representatives a bill «to establish the Territory of Nebraska,» and Douglas afterward asserted that he took this method of serving notice on the secretary of war to discontinue using that Territory as the dumping-ground for Indians. In 1848 Douglas, now chairman of the Committee on Territories in the Senate, introduced in that body a bill for the same purpose. In December 1851 Willard P. Hall of Missouri gave notice in the House of a bill for the organization of Nebraska; but none of these bills got beyond the committee stage. On 2 Feb. 1853 William A. Richardson of Illinois, the leading lieutenant of Douglas in the House, introduced still another bill «to organize the Territory of Nebraska.» This bill, which, like all of its predecessors in question, made no reference to slavery, passed the House, 10 Feb. 1853; but in spite of the strenuous endeavors of Douglas in its behalf, it failed of consideration in the Senate. The long debate over this bill in the House disclosed clearly that the primary object of members from the Northwest, who were its champions, was to protect and encourage travel over the great upper line to the Pacific coast, and make way for the ultimate construction of the already much talked of Pacific railroad; while members from the South, and especially from the Southwest, were bent on keeping this northern region open for the colonization of their undesirable Indian tribes, with the purpose of securing travel and the railroad to the Pacific coast through their own country.

Early in the session of the next Congress — 14 Dec. 1853 — Senator Dodge of Iowa, a coadjutor of Douglas in this enterprise, introduced «a bill to organize the Territory of Nebraska.» This bill also originally contained no reference to slavery; but by amendment it became the famous Kansas-Nebraska Bill, which finally became a law 30 May 1854. On 4 Jan. 1854 the Senate Committee on Territories, through Douglas, reported a substitute for the Dodge bill which contained the compromise provision of the Utah and New Mexico acts; namely, that «the Territory of Nebraska, or any portion of the same, when admitted as a State or States, shall be received into the Union with or without slavery, as their constitutions may prescribe at the time of their admission.» In his famous report, accompanying this bill, Douglas points out that «eminent statesmen hold that Congress is invested with no rightful authority to legislate upon the subject of slavery in the Territories, and that therefore the 8th section of the Missouri Compromise is null and void; while the prevailing sentiment in large sections of the Union sustains the doctrine that the Constitution of the United States secures to every citizen the inalienable right to move into any of the Territories with his property of whatever kind or description, and to hold and enjoy the same under the sanction of law.» The report pointed out also that under this section it was a disputed point whether slavery was prohibited in the new country by valid enactment, and advised against the undertaking by Congress to decide these disputed questions. The bill was further amended so as to provide that all questions pertaining to slavery in the Territories and the new States to be formed therefrom be left to the decision of the people residing therein; that cases involving title to slaves be left to the courts; and that the provision of the Constitution in respect to fugitive slaves should be carried out in the Territories the same as in the States. On 16 January Senator Dixon of Kentucky offered an amendment, which was accepted by Douglas, expressly repealing the slavery restriction clause of the Missouri Compromise; and the bill passed with these amendments.

The repeal of the Missouri Compromise restriction was hotly denounced by the anti-slavery element, and was seized with alacrity and used with great effect as a political weapon by antislavery agitators and politicians; and Douglas was also savagely denounced for selfish subserviency to the South for the sake of winning the Presidency. But Douglas and his friends ably and plausibly defended the repeal of the Missouri restriction on the ground that it was consistent with and the natural sequence of the popular sovereignty compromise of 1850; that there was danger that it would be held unconstitutional by the courts; that there was ground for fear that Dixon's amendment, as he proposed it, would legislate slavery into the Territories, and that on the whole Douglas, as leader of the dominant party, and having regard to the preservation of the Union as well as to the vexatious slavery question, made the safest and best terms practicable in securing the right of the people to decide the question of slavery for themselves. In the course of the debate on the bill Douglas, as well as Thomas H. Benton, who was opposed to the repeal of the Missouri restriction, insisted that, left to the people, slavery could never be successfully introduced into Kansas or Nebraska.

Impartial consideration of all the facts bearing upon this phase of the question leaves no ground for the charge preferred by leading historians and others that the proposed Nebraska Territory was at last divided into Kansas and Nebraska at the instance of Southern members to gain opportunity to make Kansas a slave State. The «provisional» delegate in Congress at that time from Nebraska, well known by still living contemporary citizens of the Territory as a reliable man, in his published account of his part in the transaction asserts that, before he went to Washington to attend the session of December 1853, it was agreed among the enterprising citizens of western Iowa — there were then no citizens of Nebraska — who were pushing the project for Territorial organization, that division was desirable so that one of the Territories might be directly opposite their State, and that he urged this change upon Douglas, who assented to it. In the debate on this feature of the bill Senator Dodge of antislavery Iowa and Representative Henn of the Iowa district bordering on Nebraska urged the division for the frankly expressed reasons that it would be to their advantage to have the capital of an important commonwealth opposite them, and would aid in securing the route of the Pacific railroad through their part of the country; while the representatives of slave-holding Missouri were indifferent to the question of division. Douglas himself specified the wish of the Iowa members as the basis of his reason for the division of the Territory. It is significant, moreover, that Douglas had always stood for a northern Territory, as shown by his original bills of 1844 and 1848. It is a very significant fact that the northern boundary of the Territory in each of these bills was the 43d parallel, which is identical with the northern boundary of the present State; and that the southern boundary described in the bill of 1848 was also identical with the same boundary of the State, while the southern boundary described in the bill of 1844 was only two degrees farther south. These and other incidents of a like kind show a remarkable prescience and a persistent consistency in interpreting the wishes and interests of those most directly interested in the Territory opposite the State of Iowa and on the line of the great natural highway connecting Chicago, the commercial mart of the Northwest, and the home of Douglas, with the Pacific coast. Mr. Henn in resenting «the unjust charge made on this floor by several that it (the proposed division) was the scheme of Southern men whereby one of the States to be formed out of these Territories was to be a slave State,» put the case concisely: «The bill is of more practical importance to the State of Iowa and the people I represent than to any other State or constituency in the Union.»

The Kansas-Nebraska Bill was also distinguished by more completely safeguarding the rights of Indian occupants than any previous Territorial organic acts had done; and likewise in being the first Territorial bill of that class which provided for the choice of the members of both houses of the legislature by popular election, to drop the provision requiring the submission of all acts of the legislative assembly to Congress for approval. The Territory organized by this bill comprised all of the unorganized part of the Louisiana Purchase north of the 37th parallel, which comprised all of the Purchase north of that line except the States of Iowa and Missouri, and that part of the Territory of Minnesota between the Mississippi River on the east and the Missouri and White Earth rivers on the south and west.

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Kansas State Agricultural College, a co-educational institution, located at Manhattan, Kan.; established in 1863 by the presentation to the State of Bluemont College. The college has excellent opportunities for experimental works as it cultivates 544 acres of land; 323 acres of which is owned by the college, and 221 acres leased. It is not a classical school; the departments, the courses of which lead to the degree of bachelor of science, are agriculture, English, mechanical and electrical engineering, general and domestic science. It has also a preparatory department, a music school, and a trade school. It has several short courses, as: dairying, 12 weeks in winter; agriculture and mechanics, 12 weeks in winter, for two years; horticulture and mechanics, 12 weeks in winter, for two years; and domestic science, 12 weeks in fall, for two years. The faculty numbered in 1902, 59, and the number of pupils in attendance was 1,400. The school has no income from tuitions; but receives from the State $22,700; from the “Land Grant Fund” of 1862, $32,300; and by the United States Appropriation Act of 30 Aug. 1890, $25,000, making a total annual revenue of $80,000. It received also for the experiment station (United States Act of 2 March 1887) the sum of $15,000. A weekly periodical, devoted to the interests of the subjects taught in the school, and called the ‘Industrialist,’ is published by the faculty. The library has about 25,000 volumes, and the value of the college property is (1903) about $600,000.

Kansas Wesleyan University, a coeducational institution, founded in 1886 under the auspices of the Methodist Episcopal Church, at Salina, Kan. In 1902 there were connected with the school 34 professors and instructors, and pupils in attendance 985. There were in the library 5,000 volumes.

Kant, känt, **Immanuel**, German metaphysician: b. Königsberg, Prussia, 22 April 1724; d. there 12 Feb. 1804. His first education, of a strictly religious character, he received at home, his father, whose family is believed to have been of Scottish origin, being a saddler of limited means. He early showed great application to study, and was sent to the Collegium Fredericianum, and then (in 1740) to the university of his native city. His progress at college and at the university was rapid and brilliant, his studies embracing mathematics and physics, as well as philosophy. Leaving the university after three years, he engaged in tuition, and it was not till 1755 that he took his degree. Soon after this he was appointed one of the teachers in the Königsberg University, and lectured on logic, metaphysics, mathematics, and natural philosophy, to which, at subsequent periods, he added natural law, moral philosophy, natural theology, and physical geography. In 1770 he became a full professor, obtaining the chair of logic and metaphysics, a post that he occupied till 1797. Dissatisfied with the dogmatisms of Wolff and the skepticism of Hume, he set himself to investigate the field of metaphysics for himself, and in the first place proceeded to the examination of the origin, extent, and limits of human knowledge. According to him, part of our knowledge is knowledge *a priori*, or original, transcendental, and independent of experience; part of it is *a posteriori*, or based on experience. What he calls the “pure reason” has to do with the former. His great work, the ‘Kritik der reinen Vernunft’— Critique of Pure Reason (first edition 1781), contains the foundation for his whole system of philosophy. In the preface to a later work, the ‘Kritik der Urtheilskraft’— Critique of the Power of Judgment (1790), he defines “pure reason” thus: Pure reason is the faculty to understand by *a priori* principles; and the discussion of the possibility of these principles, and the delimitation of this faculty, constitutes the critique of pure reason. In the first rank of such ideas as we do not derive from experience are space and time. Kant shows that all our perceptions are submitted to these two forms, hence he concludes that they are within us, and not in the objects; they are necessary and pure intuitions of the internal sense. The three original faculties, through the medium of which we acquire knowledge, are sense, understanding, reason. Sense, a passive and receptive faculty, has, as already stated, for its forms or conditions space and time. Understanding is an active or spontaneous faculty, and consists in the power of forming conceptions according to such categories as unity, plurality, causality, etc., which categories are applied to objects of experience through the medium of the two forms of perception, space and time. Reason is the third or highest degree of mental spontaneity, and consists in the power of forming ideas. As it is the province of the understanding to form the intuitions of sense into conceptions, so it is the business of reason to form conceptions into ideas. Far from rejecting experience, Kant considers the work of all our life but the action of our innate faculties on the conceptions which come to us from without. He proceeds in a similar way with morality; the idea of good and bad is a necessary condition, an original basis of morals, which is supposed in every one of our moral reflections, and not obtained by experience. He treats this part of his philosophy in his ‘Kritik der praktischen Vernunft’— Critique of Practical Reason (1788). Other important works of his are: ‘De Mundi sensibilis atque intelligibilis Forma et Principiis’ (1770); ‘Prolegomena zu einer jeden künftigen Metaphysik, die als Wissenschaft wird auftreten können’ (1783); ‘Grundlegung zur Metaphysik der Sitten’ (1785); ‘Metaphysische Anfangsgründe der Naturwissenschaft’ (1786); ‘Die Religion innerhalb der Grenzen der blossen Vernunft’ (1793); ‘Metaphysik der Sitten’ (1797). Complete editions of Kant have appeared edited by Rosenkrantz and Schubert (1838–42), Hortenstein (1867–9); and Kirchmann. English translations include those of the ‘Critique of Pure Reason’ by Meiklejohn (1854) and Max Müller (2d ed. 1896); of the ‘Prolegomena’ by Mahaffy and Bernard (2d ed. 1889); Bax (1883); Carus (1903); of the ‘Critique of Practical Reason’ by Abbott (2d ed. 1898); of the ‘Critique of Judgment’ by Bernard (2d ed. 1892); of the ‘Philosophy of Laws’ by Hastie (1887); of the ‘Principles of Politics’ by Hastie (1891); of the ‘Cosmogony’ by Hastie (1900). Consult: E. Caird, ‘Critical Philosophy of Kant’ (1859); Mahaffy, ‘Kant's Critical Philosophy for English Readers’ (1872–74); Watson, ‘Kant and his English Critics’ (1881); Stirling, ‘Textbook to Kant’ (1881); Morris, ‘Kant's Critique of Pure Reason’ (1882); Paulsen, ‘Immanuel Kant, sein Leben und seine Lehre’ (1898, Eng. trans. 1902); Vaihinger, ‘Commentar zu Kants Kritik der reinen Vernunft’ (1881–92).

Ka'olin. See Clay; China; Porcelain; Pottery.

Kapok', a kind of silk-cotton. See Silk-cotton Tree.

Kapp, Friedrich, frĕd'rĭʜ käp, German biographer and historian: b. in Hamm, Westphalia, 13 April 1824; d. Berlin 27 Oct. 1884. He left Germany at the outbreak of the revolution of 1848, and settling in New York in 1850, took active part in American politics. In 1860 he was a presidential elector and in 1867 commissary of education. Returning to Germany in 1870, he entered the Reichstag in 1872. His works, which mainly refer to the United States, include ‘American Soldier Traffic by German Princes’ (1864); ‘German Emigration to America’ (1868); ‘History of the German Migration into America’ (1867); ‘Frederick the Great and the United States’ (1871); etc.

Kara (kä'rä) **Sea,** an arm of the Arctic Ocean indenting the north coast of Siberia, between Nova Zembla and Yalmal Peninsula. The Yenisei and Ob rivers flow into this sea. Since 1875 when Nordenskjöld made his voyage in the Vega, several navigators have sailed on this sea and found that it is not, as once supposed, ice-locked all the year; but is open in July and August. Consult: Hovgaard, an article in the ‘Scottish Geographical Magazine’ (January 1890) on a route to the North Pole.

Karadzic, kä-rä'jĕch, **Vuk Stefánovic,** Servian author: b. Trschitsch, Servia, 7 Nov. 1787; d. Vienna 7 Feb. 1864. The two great works of his life were the reformation of the Servian literary language (which, up to his time has been a very debased medium, being either rude Slavonian or a hybrid jumble of Serb and Slavonian), and the publication of the ‘Popular Serb Songs’ (4 vols. 1814–33; 3d ed. 1841–46). His epoch-making Serbian-German-Latin ‘Dictionary’ appeared in 1818. The songs attracted widespread attention, and were translated into every European tongue. He was the founder of modern Servian literature.

Karageorgevitch, kä-rä-gä-org'a-vēch, PRINCE **Peter,** king of Servia: b. Belgrade 1846. He was educated at Belgrade, but when his father, Alexander Karageorgevitch, was driven from the throne in 1858, he became a soldier of fortune and pretender. After training in France at the St. Cyr school and the Military staff college, he fought in the foreign legion during the Franco-Prussian war. Later he took part in Herzegovina's struggle for liberty. Upon the assassination of Alexander I. Obrenovitch in 1903, Prince Peter was proclaimed king of Servia by the army. See SERVIA, *History*.

Ka'raites. See JEWISH SECTS.

Karankawan, kạ-răn'kạ-wăn, an American Indian tribe, now extinct. They formerly lived along the Texas coast in the vicinity of Matagorda Bay, and originally came from Central America. They were first mentioned in 1687, by the French explorer Joutel, and were regarded as cannibals. They were uncompromisingly hostile to the whites. In 1843, fifty survivors of the race removed to Mexico, where in 1858 the last of them were exterminated by Mexican ranchers.

Karaveloff, kä-rä-vä'lŏf, **Petko** (PETER), Bulgarian statesman: b. Kalofer 1840; d. Sofia 7 Feb. 1903. He studied in Moscow, in 1878, became vice-governor of Vidin, in 1879 was a founder of the Liberal party, in 1880 was appointed minister of finance. and later in that year assumed the premiership. After the *coup d'état* of Prince Alexander, he retired to Eastern Rumelia, but on the restoration of the constitution in 1883 returned, and in 1884–6 was again premier. In 1886 he was appointed to the regency on the abdication of Alexander (7 Sept.), but after the election of Ferdinand (7 July 1887) his power waned; in 1892 he was sentenced to a five-years' imprisonment for conspiracy. Pardoned, however, he was elected to the Sobranye, or national assembly, and from 4 March 1901 to January 1902 he was premier, his resignation being compelled by opposition to his conclusion of a French loan.

Karawala. See CARAWALA.

Karli, kär'lē, a Buddhist cave-temple of India, rich in sculpture, and divided like a church into nave and aisles, with an apse. The temple probably belongs to the 1st century.

Karlowitz, kär'lō vĭts, or **Carlovitz,** a town of the Austrian empire, on the frontier of Slavonia. The great vine mountain in the vicinity yields the best and strongest qualities of Hungarian wines. A peace was concluded here in 1699, between Austria, Poland, Russia, Venice, and Turkey. In 1848–9, Karlowitz was the focus of the Servian rebellion against Hungary, and the theatre of collision between the Servians and the Magyars, and at a later period between the Hungarians and the Austrians. The town contains a Greek cathedral and is the seat of the Greek archbishop of the Servian nationality. Pop. (1900) 5,643.

Karlsbad. See CARLSBAD.

Karlshamn. See CARLSHAMN.

Karlskrona. See CARLSCRONA.

Karlsruhe. See CARLSRUHE.

Karlstad. See CARLSTAD.

Karlstadt. See CARLSTADT.

Kar'ma, (1) in Buddhism, the judgment at death which determines the future state of the deceased. It is also the fiat of the Buddhists on actions, pronouncing them to be meritorious, or otherwise. (2) In theosophy, Karma means the unbroken sequence of cause and effect, each effect being in its turn the cause of a subsequent effect. It is a Sanskrit word meaning «action» or «sequence.» See BUDDHISM; EGO; THEOSOPHY.

Karma'thians, a former Mohammedan sect, founded in Irak by Karmath during the 9th century. Missionaries were trained to spread his creed, and one of them, Abu Saïd, gained a strong hold on the people of the Persian Gulf. The caliph, afraid of the influence of the new sect, sent an army for its suppression, but he was defeated, and Abu Saïd took possession of the whole country.

Kar'nak. See THEBES.

Karr, Jean Baptiste Alphonse, zhŏn bäp-tēst äl-fôns kär, French novelist and satirist: b. Paris 24 Nov. 1808; d. Nice, France, 30 Sept. 1890. He was educated at the Collège Bourbon, where he subsequently taught, and began in 1832 to write for the ‘Figaro,’ becoming its editor-in-chief in 1839. In that year he established ‘Les Guêps’ (the Wasps), a monthly journal of satire which aroused many enmities. His earliest books were novels, among them: ‘Sous les Tilleuls’ (1832); ‘Vendredi Soir’ (1835); ‘Geneviève’ (1838); ‘Clotilde’ (1839); among later works may be named: ‘Voyage autour de mon Jardin’ (1845): ‘Gaîtiés romaines› (1870); ‹Dieu et Diable: le Credo du Jardinier› (1875). The latter portion of his life was passed at Nice where he was a devoted gardener, several flowers having been named in honor of him.

Karroos, kä-rooz', the Hottentot name, now adopted by physical geographers, for the table-land or extensive plains between the mountain ranges of Cape Colony. They are fertile during the short rainy season, but during the dry season they assume the appearance of parched arid deserts, though even then flocks and herds find a certain amount of food on them. In recent times artificial methods of procuring water for these tracts have been adopted. In some places great reservoirs have been made to impound the water of permanent streams, or streams that exist only in time of rain; many wells have also been sunk, from which water may be pumped by means of windmills if it does not rise of itself. In this way large areas of the Karroos are now occupied as farms on which more or less grain is grown. Kloof, a sort of companion name to karroo, is applied to the longitudinal valleys extending between the ranges of the adjacent hills.

Kars, (1) a province of Russia, in the southwestern part of Transcaucasia; area, 7,188 square miles. It is mountainous, but the chief occupations are agriculture and stock-raising. Pop. estimated, 300,000. (2) Kars, the capital of the province of Kars, is about in the centre of the province, on a high plateau, barren in part but productive in the vicinity of the city. It was formerly a Turkish fortified city, and since it became a Russian possession (1878) the fortifications have been strengthened. The city has some manufactories, carpet-mills, cotton and woolen factories. Pop. about 22,000.

Karun, kä-roon', the only navigable river of Persia, and important as a route to the interior. About 117 miles from the mouth navigation is impeded by the rapids of Ahwaz. Formerly the Karun flowed direct to the sea, but now it traverses an artificial channel leading it into the Shat-el-Arab, which it joins at Mohammerah. It has recently been opened to foreign trade as far as Ahwaz.

Karyokinesis, kar"ĭ-ō-kĭ-nē'sĭs, the process of development of the ovum under the influence of fertilization. See Cell; Embryology.

Kasan. See Kazan.

Kasbin, käs-bēn', or **Kazvin** (also spelled Casveen, Casbin, and Kazbin), Persia, a town in the province of Irak-Ajemi, about 90 miles west-northwest of Teheran. It is built of kiln-burned bricks, and had once a great number of elegant mosques and well-constructed bazaars, but a large proportion of the buildings are now ruinous and deserted, partly as the result of repeated earthquakes. The manufactures include tanning, weaving, etc., and there is a considerable transit trade. There are many vineyards and gardens in the neighborhood. Pop. estimated at 40,000.

Kashgar, käsh-gär'. See Cashgar.

Kashmir. See Cashmere.

Kaskas'kia, an American Indian tribe of the Algonquian family, formerly occupying a part of southern Illinois. In 1832, the survivors of the race, with the Peorias, removed to Kansas, and affiliated with the Weas and Piankishaws. The four tribes removed to Indian Territory in 1867, and in 1903 scarcely 100 members of the four tribes remained. See Indians.

Kaskaskia, Ill., a township in Randolph County, on both sides of the Kaskaskia or Okaw River, at its junction with the Mississippi opposite Ste. Genevieve, Mo. A part of it now obliterated was the oldest town in the West, the first permanent white settlement in the Mississippi Valley. Marquette in 1675 had established a mission among the Kaskaskia Indians near the present Utica, Ill., on the Illinois River; the Jesuits Marest and St. Cosme, guided by Tonty (q.v.), removed the mission in 1700 to the Mississippi bottoms three miles from the river, near the Kaskaskia. It throve greatly, and was not only a large Indian market, but sent produce and furs to New Orleans. Fort Chartres was built there in 1720; eminent French officers and adventurers came thither — as Vaudreuil and the commandant Chevalier de Bertel — and with its gay French life it was named «the Paris of the West.» A noted Jesuit college and convent were maintained there. It formed one of the chain of posts by which France was to hem in English colonization; but in 1763 it fell into the hands of the English, who made it their capital in that region. On 4 July 1778 George Rogers Clark (q.v.), with a company of 200 Virginia militia, captured it for the United States by a night attack; this enabled us to claim and obtain possession of the Northwest Territory by the peace of 1783, and changed the destiny of this whole region. It remained a leading western town, and was the capital of Illinois as a Territory (1809) and a State (1818); but on removal of the seat of government to Vandalia in 1819, it began to decline. The river steadily encroached on the meadow; and in 1892 united its course with the Okaw, converting a large part of the old site, with most of the ancient buildings, into an island, which in 1899 crumbled into the river after several great floods. North of the junction still remains about a third of the town site, with the foundations of a church and of the capitol building. In 1891 the Illinois legislature appropriated $50,000 to remove the old cemetery to a point on the bluffs, and a large monument has been erected there. Consult: ‹Kaskaskia: A Vanished Capital› (in ‹Chautauquan,› Vol. XXX., 1900); ‹Kaskaskia and its Parish Records› (in ‹Magazine of American History,› Vol. VI., 1880).

Kaskaskia River, rises in Champaign County, Ill., and flows southwest through Moultrie, Shelby, Clinton, Fayette, and St. Clair counties, finally joining the Mississippi in Randolph County. It formerly entered at Chester, but in 1891 (see below) the great river cut away the neck of land at Kaskaskia and joined it there. It is nearly 300 miles long, and navigable to Vandalia, 150 miles. It flows through a fertile rolling country which is part of the Illinois coal field.

Kassai, kä-sī', a tributary of the Kongo, which it enters from the south a short distance above Stanley Pool, pouring into the Kongo a vast volume. It is navigable for hundreds of miles.

Kassala, kä-sä'lä, North Africa, a town at the southeastern extremity of the Egyptian Sudan, near the border of Abyssinia, formerly belonging to Egypt, and once a commercial centre. Before the Mahdi's uprising it had a population of perhaps 20,000. Italians captured it from the Mahdists in 1894, and in 1897 it was restored to Egypt. Its population is now supposed to be about 10,000.

Kas'son, John Adam, American lawyer and diplomatist: b. Charlotte, Vt., 11 Jan. 1822. He was graduated from the University of Vermont in 1842, studied law at Worcester, Mass.; was admitted to the bar, and in 1857 moved to Iowa and continued the practice of his profession. He became active in the Republican party, was a delegate to the national convention in 1860 and chairman of the State committee in the campaign; was assistant postmaster-general in 1861–2; and commissioner to the International Postal Congress at Paris in 1863. He was elected to Congress in 1863 and served until 1867; in the next year was elected to the Iowa State legislature, and from 1873 to 1877 was again a member of Congress. He was then appointed minister to Austria, which position he held till 1881. In 1881–4 he served again in Congress, and from 1884–5 was minister to Germany; in 1885 he was commissioner to the Kongo International Conference at Berlin, and special envoy to the Samoan International Conference in 1893. In 1897 he was appointed special commissioner plenipotentiary to negotiate reciprocity treaties as provided for by the Dingley Tariff Law, and in 1898 was a member of the American Canadian Joint High Commission. He has written 'History of the Monroe Doctrine' (in the 'North American Review' 1881); 'History of the Formation of the United States Constitution' (1889).

Kästner, kĕst'nĕr, **Abraham Gotthelf,** German mathematician and poet: b. Leipsic 27 Sept. 1719; d. Göttingen 20 June 1800. He received an appointment at Göttingen, where, in accordance with the reformatory spirit which animated that university in the latter part of the 18th century, he exerted a powerful influence in delivering mathematical and natural sciences from the bondage of antiquated text-books. His 'Anfangsgründe der Mathematik' (6th ed. 1800), and his various other writings, inaugurated a more enlightened era of scientific study in Germany. He took a conspicuous part in the formation of the celebrated union of Göttingen poets, and by his assistance the elder Boye succeeded in introducing, through the instrumentality of the 'Musenalmanach,' an entirely new generation of poets to the public. His general popularity was chiefly due to his 'Sinngedichte.' A portion of his epigrammatic poems were included in his 'Miscellaneous Writings' (1783).

Kastner, Johann Georg, yō'hän gā'ōrg käst'nėr, German composer and writer on music: b. Strasburg 9 March 1810; d. Paris 19 Dec. 1867. He studied with Maurer and Romer; in 1832–5 composed four operas, of which 'Die Königin der Sarmaten' (1835) is chief; and then removed to Paris, where he wrote other operas, among them his best work, 'Le dernier Roi de Juda,' presented at the Conservatoire in 1844. From 1837 he also published a series of elementary treatises on music, a once authoritative work on instrumentation being perhaps the best. He was made an associate of the Académie Française.

Katab'olism, otherwise known as destructive metabolism; the chemical changes occurring within an organism and resulting in the formation of simpler products through the decomposition of more complex ones.

Katahdin, kạ-tă'dĭn, or **Ktaadn,** the highest mountain in Maine, situated in Piscataquis County and in the central part of the State. The region is difficult of access, the Penobscot River being the only thoroughfare, and its course being interrupted by frequent shoals and falls. The mountain, which has an altitude of 5,385 feet, is entirely of granite, and stands in abrupt walls with acres of surface exposed in naked floors. Its sides which are marked by bare spots caused by sliding rock, present a striking appearance. On its summit are found only lichens and a few dwarfish plants; half-way down, the birch and other forest trees are stunted. Over the granite rocks, even to the summit, are found boulders of trap and of other rocks not belonging to the mountain, and among them pieces of sandstone containing fossil shells. The view of the country from the summit embraces scattered mountains rising in conical granitic peaks, among which are interspersed hundreds of lakes, many of them large, and innumerable streams.

Katatypy, a new method in photography. Over the finished negative is poured a solution of hydro superoxide. This leaves, after evaporation, a uniform layer of peroxide of hydrogen. Soon the silver of the plate works upon this peroxide and produces a catalytic dissolution wherever there is silver, while in the places free from silver the peroxide remains. By this means an invisible picture of hydro superoxide is produced upon the plate. This picture can be printed from the plate directly upon common paper, to which the image is transferred.

Ka'ter, Henry, English physicist: b. Bristol 16 April 1777; d. London 26 April 1835. In 1799 he went to India where he was engaged on the great trigonometrical survey, a work to which he rendered important service. In 1814 he retired on half-pay, and henceforth occupied himself exclusively with scientific studies. He was employed by the emperor of Russia to construct standards for the weights and measures of that country; determined the length of the seconds pendulum (see KATER'S PENDULUM), investigated the diminution of terrestrial gravity from the pole to the equator; and invented the «floating collimator,» an instrument of great use to trigonometers. With Dr. Lardner he wrote the 'Treatise on Mechanics' in the 'Cabinet Cyclopedia.'

Kater's Pendulum, a contrivance for measuring the force of gravity, named from its inventor Henry Kater (q.v.). The principle governing its action is the fact that in the case of a physical (compound) pendulum the centres of oscillation and of suspension are interchangeable. It is a bar pendulum with two sets of knife edges, symmetrical in form, but not in the distribution of masses with reference to the geometrical centre; and, somewhat modified and improved, is now the standard for geodetic work.

Kat'ipo, the New Zealand name for alleged poisonous spiders of the genus *Latrodectus* (q.v.).

Katipunan (kä-tē-poo'nän) **Society,** a secret society in the Philippines, organized originally to oppose Spanish supremacy. At the adjournment of the Filipino Congress it was decreed that the supreme council of the Katipunan Society should assume control of native affairs. The society organization was purely military, with a chief or colonel assigned to each 100 members. Each member signs an oath written in his own blood, swearing under most revolting penalties to serve and obey the society. The membership in the organization has gradually decreased since the American occupation.

Katsura, käts-wē'ä, COUNT, Japanese soldier and statesman: b. Chosiu 1847. He received a military training in Prussia, entered the Japanese army in 1867, fought in the war of the Mikado's restoration, was vice-minister of the army in 1886–91, and in the Chino-Japanese war (1894–5) commanded the 3d division, with which 4 March 1895 he captured New-chwang. In 1896 he was governor-general of Formosa, in 1898–1900 minister of war, and in 1901 became prime minister.

Katte, Walter, American civil engineer: b. London, England, 14 Nov. 1830. Coming to the United States in 1850 he was resident engineer of the Pennsylvania State canals 1857–8, and subsequently held various engineering posts of responsibility. From 1865 to 1875 he was in the employ of the Keystone Bridge Company of Pittsburg, superintending at this time the building of the steel arch bridge at St. Louis. He was chief engineer of the New York elevated railroad 1877–80, and from 1880 to 1898 held similar posts on other important railroads, including the New York Central.

Ka'tydids, large neuropterous insects of the grasshopper family *Locustidæ*, remarkable for their loud and shrill call. The katydids belong to several allied genera which have the head obtuse in front, the wings and wing-covers large and leaf-like, and the color bright green. Highly developed striduling organs are found in the males in the form of transparent drum-like structures at the base of the wing-covers, by the friction of which, one against the other, as the wings are raised and lowered, the well-known call is produced. This is heard only at night (though some species have quite different day calls as well) and is so loud and shrill as to be distinctly audible at a distance of a quarter of a mile. The call of the males is answered by chirps from the females. The characteristic eggs are gummed to twigs in two contiguous over-lapping rows. Katydids are peculiarly American. The common species is *Cystophyllus concavus*, known by its very broad coarse-veined wing-covers and long ovipositor. In *Phylloptera oblongifolia* the wing-covers are narrower and the veins finer. Other related genera are *Phancroptera* and *Microcentrum*.

Katzbach (käts'bäH) **River,** a small stream in Silesia, Prussia, falling into the Oder at Parchwitz. On its bank 26 Aug. 1813 a battle was fought between the French and the Prussians in which the latter under Blücher won a signal victory. The French lost 12,000, and 18,000 were taken prisoners.

Katz'er, Frederic Xavier, American Roman Catholic archbishop: b. Ebensee, Austria, 7 Feb. 1844; d. Fond du Lac, Wis., 20 July 1903. He came to this country in 1864, and was ordained to the priesthood in 1866. Until 1875 he was a professor in the Seminary of St. Francis in Milwaukee, when he became pastor of the cathedral at Green Bay and secretary of Bishop Krautbauer. After four years of labor in this capacity, he was appointed vicar-general of the diocese of Green Bay, and on the death of Bishop Krautbauer, in December 1885, became administrator, and in May 1886, bishop of Green Bay. In December 1900 he was chosen archbishop of Milwaukee.

Kauai, kow-ī', one of the Hawaiian Islands, the most northern of the group, in lat. 22° N. and long. 159° 30' W.; area, 590 square miles. It is of volcanic origin, its highest elevation reaching nearly 6,000 feet; but although mountainous in character the island has a soil of great fertility, a considerable portion of which, mainly in the northern part, is under cultivation. Sugar is the chief product, and tropical fruits are also largely grown. There is great extent of forest land, and the island is well supplied with streams, the largest of which is Hanalei. The principal harbors are Hanalei, Koloa, Nawiliwili, and Waimea. Pop. (1900) 20,734.

Kauffman, kowf'män, **Marie Angélique Catherine,** commonly known as ANGELICA KAUFFMAN, Swiss painter: b. Coire, Switzerland, 20 Oct. 1841; d. Rome 5 Nov. 1807. She was the pupil of her father, John Joseph Kauffman, a painter of little note. Her first work of importance was a portrait of the Duke of Modena and his duchess. She then collaborated with her father in the decoration of the parish church and castle of Schwarzenburg, his birthplace, painting many portraits in the meantime. Going to Florence, she was hindered in her artistic career by her passionate devotion to music and singing, but in 1763 finally abandoned all other pursuits for that of painting. She fell under the influence of Winckelmann at Rome, and produced the ‹Mother of the Gracchi.› She also did some work in co-operation with the Venetian landscape painter Zucchi, whom she subsequently married. It was at this point in her life that she developed the particular sentimental style of her paintings as seen in ‹Anna and Abra›; and ‹Samma at the Grave of Benoni,› which created a furore. In London (1765) she became the darling of court and aristocracy, and was loaded with wealth and honor; she was made member of the Royal Academy and was thought to have inspired Sir Joshua Reynolds with tender feelings. She was, however, unfortunate in marrying a Swede who called himself Count Hom, from whom she was later divorced. She eventually married Zucchi, and settled in Rome (1781). While her tenderness borders on mawkishness, and her designs are monotonous, her imaginative figures have an elevated charm which was not without its influence in circles where George Morland was typical of English art. Her personality cast a reflection which enhanced the impression which her pictures made on her contemporaries, and the ‹Miss Angel› of Mrs. Thackeray Ritchie exhibits with tact and fidelity this interpretation of her somewhat remarkable career.

Kaufman, David S., American politician: b. Cumberland County, Pa., 1813; d. Washington, D. C., 13 Jan. 1851. A graduate of Princeton

University, he removed to Natchez, Miss., where he studied law. In 1837 he settled in Nacogdoches, Texas, and the next year was elected to the Texas Congress. He was twice re-elected and twice chosen speaker of the House. In 1843 he entered the Texan Senate, taking an active part in favor of annexation, and being elected one of the first members of the House of Representatives from Texas (1846–51).

Kaukauna, kã-kâ'nạ, Wis., city, in Outagamie County; on the Fox River, and on two divisions of the Chicago and Northwestern railroad; about 21 miles southwest of the city of Green Bay and seven miles northeast of Appleton. At this point the Fox River has a fall of 50 feet within one mile, which gives the city excellent water power. A government ship canal has been built to overcome the obstruction to navigation caused by the rapids. The place was first settled in 1790 by Dominick Ducharme, and was incorporated as a town in 1850. It was chartered as a city 5 April 1885. The city has two banks with a combined capital of $160,000; and the bookings show a total of business of $800,000. The chief industrial wealth of the city is derived from railroad shops, employing 450 men; Union Bag and Paper Company works, 300 employees; Pulp and Paper Company works, 225; Outagamie Paper Company works, 175; Kaukauna Fibre Company, 80; Lindane Pulp Company, 80. The city has 10 churches, one high school, two graded public schools, and two graded parish schools. About one half the population are Germans. Pop. (1900) 5,115.

James I. Tower,
Editor of 'Sun.'

Kaulbach, Wilhelm von, vĭl'hĕlm fōn kowl'bäH, German painter: b. Arolsen 15 Oct. 1805; d. Munich 7 April 1874. He learned the rudiments of his art from his father who was a goldsmith and engraver on copper. He was a good draftsman when he went to Düsseldorf in 1821 and entered the Art Academy where his chief teacher was Cornelius, already acknowledged as the head of the Düsseldorf school of historic painting. When Cornelius in 1825 removed to Munich, at the invitation of King Ludwig of Bavaria, he followed him and soon became his disciple in the art of ceiling decoration, examples of which are 'Apollo and the Muses' in the great hall of the Odeon, and the allegorical figures of the 'Four Chief Rivers of Bavaria,' and of 'Bavaria' in the portico of the royal palace. His pure and classic power of design is well exhibited in the 16 wall paintings, illustrating the story of 'Cupid and Psyche,' in the palace of Duke Maximilian at Munich. He was at this time attracted to the study of Hogarth's works, the fruit of which appeared in his illustration of books, including the works of Shakespeare, Goethe, and Schiller, and the Reineke Fuchs. He painted many great incidents in the history of Germany, including twelve scenes from Klopstock's 'Hermann's Fight,' and the 'Death of Hermann,' wall paintings in the queen's palace at Kingsbau. But his most ambitious and comprehensive works are those in which he endeavored to represent the progress of the human race by a series of typical historic tableaux. These comprise the 'Tower of Babel'; 'Age of Homer'; 'Destruction of Jerusalem'; 'Battle of the Huns and Romans'; 'The Crusaders'; 'The Reformation' (1847–63). The range of his intellectual ideas, his wonderful power of generalization, his mastery of every style of painting from caricature to the sublimity of the Italian cinquecentists, as represented by Michelangelo, have no parallel among modern painters. His coloring may be a little cold, sometimes a little crude, but his sense of form, his loftiness of conception and his genius for harmonious composition have won for him the first place among German artists of the transition period between the idealism of Cornelius and the realism of the modern historic school.

Kauri, kow'rĭ, the native name of a tree, and of the valuable gum derived from it. It is the most conspicuous species (*A. australis*) of the East Indian and Australian genus *Agathis* (formerly *Dammara*) of coniferous trees,—a native of New Zealand, where it grows only at the northern extremity of the North Island. It reaches the height of 150–200 feet, and its timber is much valued for building purposes, for making furniture, etc., and still more for masts and ship-building, but it is becoming very rare. The resin of this tree, the kauri gum, forms a valuable export, and is used in making fine varnish, etc. Most of it is obtained in a semi-fossil state, by digging in places where the tree no longer grows. See Dammar.

Kautz, kowtz, **Albert,** American naval officer: b. Georgetown, Ohio, 29 Jan. 1839. He was graduated at the United States Naval Academy in 1859, became a lieutenant in 1861 and rose through gradual promotion to the rank of rear-admiral in 1898. He was flag-lieutenant to Farragut in 1862, and when New Orleans was surrendered he entered the city and raised the national flag over the custom-house. He took command of the Pacific station and in the following March was prominent in the settlement of the Samoan troubles. He was retired in January 1901.

Kautz, August Valentine, American general: b. Ispringen, Germany, 5 Jan. 1828; d. Seattle, Washington, 4 Sept. 1895. He was a brother of Albert Kautz (q.v.), and his parents settling in Ohio in 1832, he was graduated from West Point in 1852. He served through the Civil War in the Federal army, distinguishing himself in several engagements, was promoted colonel in 1874, and brigadier-general in 1891. He published: 'The Company Clerk' (1863); 'Customs of Service for Non-Commissioned Officers and Soldiers' (1864); and 'Customs of Service for Officers' (1866).

Kautzsch, kowch, **Emil Friedrich,** German Protestant theologian: b. Plauen, Saxony, 4 Sept. 1841. He was educated at the University of Leipsic where he became tutor in Old Testament exegesis in 1869, and professor extraordinary in 1871. From 1872 to 1880 he was professor at Basel, at Tübingen 1880–8, and at Halle from the last named date. With Socin and Zimmerman he founded the Palestine Exploration Society of Germany in 1877, and among important works which he has edited are: the 22d to the 26th editions of Gesenius' 'Hebrew Grammar' (1878–96); and the 10th and 11th editions of Hagenbach's 'Encyklopädia und Methodologie der theologischen Wissenschaften' (1880–4).

Kava-Kava. See Ava.

Kavanagh, kav'ạ-nạ, **Julia**, Irish novelist: b. Thurles, Ireland, 7 Jan. 1824; d. Nice, France, 28 Oct. 1877. She wrote a large number of novels, the scenes of which were almost invariably laid in France, where her life was mainly spent until she began a literary career in London in 1844. Among her works are: 'Nathalie' (1851); 'Daisy Burns' (1853); 'Two Lilies' (1877); 'Woman in France During the 18th Century' (1850); 'A Summer and Winter in the Two Sicilies' (1858); 'French Women of Letters' (1861); 'English Women of Letters' (1862). Her novels and other works were popular both in this country and in England.

Kaveri, or **Kavery.** See CAUVERY.

Kaw (more correctly KANZA), a branch of the Osage division of the Siouan Indian stock, formerly living on the lower Kansas River, and early in the 19th century estimated at 1,300. In 1846 the government removed them to a reservation in the present Oklahoma, west of the Osage River; where they dwindled so rapidly that in 1900 there were only 217, over half of them of mixed blood.

Kay, John, English inventor: b. Walmersley, Lancashire, England, 16 July 1704; d. France, after 1764. In 1733 he invented the fly-shuttle, for which a patent was granted him, and in 1745 a power loom for the weaving of narrow goods, a patent for which was also granted. These inventions, however, so greatly aroused the anger of the working classes, who feared that the machines would entirely supersede hand labor, that they stole Kay's machines, wrecked his home, and obliged him to flee to France, where he died in poverty.

Kaye, SIR **John William**, English military historian: b. Acton, Middlesex, 1814; d. London 24 July 1876. He was for a number of years an officer in the Bengal artillery, but resigned in 1841. In 1856 he entered the East India Company, and upon the transfer of the government of India to the crown, succeeded John Stuart Mill in the political department of the India office. His works consist of histories and biographies relating to the East, among them being 'A History of Afghanistan' (1851–3); 'History of the Administration of the East India Company' (1853); 'A History of the Sepoy War in India' (1857–8; London 1864–75), a comprehensive narrative of the celebrated Mutiny down to the fall of Delhi; 'Lives of Indian Officers' (1867); 'Essays of an Optimist' (1870).

Kazaks'. See KIRGHIZ.

Kazan, kä-zän', Russia, a fortified city, capital of the government of the same name, on the Kazanka, about four miles above its junction with the Volga, 460 miles east of Moscow. It properly forms three towns — the kremlin or citadel, the middle town, and the lower town. Many Mohammedan Tartars still reside here, engaged in business. It is a bishop's see, and the seat of a small university, founded in 1803. It has also several other schools. Here are large soap-works and tanneries, also manufactures of woolen, cotton, lace, and earthenware. It carries on an extensive trade. The caravans to Bokhara and China pass through Kazan. At a little distance from Kazan is an admiralty establishment, with a navigation school, magazines, and a dock-yard, where vessels are constructed, and sent down the Volga to the Caspian Sea. Pop. about 135,000.

Ke'a, a large olive-green parrot of New Zealand (*Nestor notabilis*) with the hawk-like beak of its race, which in its former wild condition fed chiefly upon insects, but since the introduction of sheep into the South Island (to which it is confined) has become a meat eater. These birds haunt the vicinity of slaughtering pens, and feed with avidity upon offal, sheepheads and the like. This led them to attack wounded sheep, or those with sores; and finally taught some of these parrots to alight upon the back of a sheep, pull out the wool and even tear away the living flesh. These injuries were usually upon the loins, and the fat about the kidneys seems to be the special attraction. So many keas have been killed by herdsmen that the species is now rare. Compare KAKA; and consult Buller, 'Birds of New Zealand' (1888).

Kean, kēn, **Charles John**, English actor: b. Waterford, Ireland, 18 Jan. 1811; d. Queensborough Terrace, Chelsea, London, 22 Jan. 1868. He was second son of Edmund Kean (q.v.), He made his first stage appearance 1 Oct. 1827 as Young Norval in 'Douglas.' In 1830 he visited the United States, where he was favorably received before he had made a London reputation. In 1850–9 he managed the Princess Theatre, where he introduced more elaborate machinery and setting than had yet been seen on the English stage, revived Byron's 'Sardanapalus,' and appeared (13 Jan. 1855) in his greatest role, Louis XI., in Boucicault's adaptation of de la Vigne's play of the name. His Hamlet was his chief tragic part, but he was best in melodrama. He withdrew from the stage 28 May 1867. Consult: Cole, 'Life and Theatrical Times of Charles Kean' (1859); Cook, 'Hours with the Players,' Vol. II. (1881).

Kean, Edmund, English tragedian: b. London 4 Nov. 1787; d. Richmond Surrey 15 May 1833. His supposed parents were connected in a low capacity with the theatrical profession. He was early on the stage, and for several years wandered about the provinces, now as reciter and singer, now as tumbler in a circus, and later as a member of itinerant companies. He married Miss Chambers, an actress in his company, in 1808. In 1814 he appeared at Drury Lane as Shylock. His triumph was decided and he at once commanded large salaries. Hazlitt and Lamb eulogized him. Coleridge said: «To see Kean act is like reading Shakespeare by flashes of lightning.» At Kemble's retirement in 1817 Kean took the foremost place on the English stage. He appeared in several other tragic roles, among them Richard III., Hamlet, Lear, Sir Giles Overreach, and Othello. In these characters he has perhaps never been equaled. He first came to the United States in 1820, when he was seen with enthusiasm in New York, Boston, and Philadelphia. A second, but much less successful tour in 1825 was extended to Canada, where he was chosen a chief of the Huron Indians. His hold on the public remained uninterrupted until 1825, when he appeared in the character of co-respondent in an action of divorce. He never regained public favor; his dissolute habits also began to tell on him, and he made his last appearance in Othello, in company with his son Charles, in 1833, but broke down during the performance, and his death took place some three months later. The biographies by Barry Cornwall (1835) and F. W. Hawkins (1869), although the best existing, contain much apocryphal material.

Keane, John Joseph, American Roman Catholic prelate: b. Ballyshannon, Ireland, 12 Sept. 1839. When seven years old he came to America with his parents, who settled in Baltimore, Md., pursued his classical studies at Saint Charles College, Baltimore, and later took a complete philosophical and theological course at Saint Mary's Seminary, where, on 2 July 1866, he was ordained priest. He was then appointed assistant pastor at Saint Patrick's Church, Washington, D. C., and about 12 years afterward, 25 Aug. 1878, was consecrated bishop of Richmond, Va. In this new field he labored indefatigably, much of his attention being bestowed upon the negroes, and when, in 1884, the American hierarchy decreed the foundation of the Catholic University, Bishop Keane was selected to devise plans for its organization. On 12 Aug. 1888 the University was formally opened, he being chosen its first rector, and under his efficient administration it attained most gratifying success. Its generous endowments and splendid equipment were the result of his tireless efforts, and when, in January 1897, his rectorship ceased, he left the institution established upon a solid basis. The next two years he spent in Rome, where his skill in oratory won due recognition and numerous favors were lavished on him by Leo XIII. In 1899 Bishop Keane returned to America at the earnest solicitation of the board of trustees of the University, and for two years labored to augment its endowments. In 1890 he delivered the Dudleian lecture at Harvard. On 24 July 1900 he was appointed to the archiepiscopal see of Dubuque, the pallium being conferred upon him by Cardinal Gibbons, 17 April 1901. He is likewise an ardent advocate of Catholic education. His diocese now (1905) boasts a Catholic population of 100,000; 218 priests; 202 churches; 82 parochial schools; 1 orphan asylum, and 6 hospitals, besides academies and charitable institutions.

Kearney, kär'nĭ, **Denis,** American labor agitator: b. Oakmont, County Cork, Ireland, 1847. He went to sea from 1858 to 1872; and in the latter year settled in San Francisco, becoming foreman of a gang of stevedores and later going into the draying business independently. In 1877 he began an agitation among the workingmen, his attacks being directed mostly against the rights of capital and the importation of Chinese labor. Large mass-meetings were held in the so-called «Sand Lots» near the city, and the movement grew rapidly in power and importance, but dominated entirely by Kearney. Finally he was able to pack a convention which adopted a new State constitution in the interests of his movement, and very detrimental to capital and property interests. In 1878 he visited the Eastern States, speaking in the large cities, but failed to gain an important following; on his return to California he gradually lost his influence and his party sank into obscurity.

Kearney, Neb., city, county-seat of Buffalo County; on the Burlington & M. R., the Union Pa., and the Kearney & B. H. R.R.'s; about 125 miles west of Lincoln and 175 miles, in direct line, southwest of Omaha. Kearney is midway between the eastern and western coasts of the United States. The first settlement was made in 1871; it was incorporated in 1872, and received its city charter in 1889. It is in the midst of a rich agricultural region noted for wheat and live-stock. The chief industrial establishments are a furniture factory, three cigar factories, and large brick yards. The city is the seat of a State Industrial School for Boys, a State Normal School (1903), a Military Academy under the auspices of the Episcopal Church, a high school, and a public library. It has three banks, the combined capital of which is $200,000. The government is vested in a mayor who holds office two years, and in a council of eight members, elected annually. Pop. (1900) 5,634; (1904) 7,000.

F. L. Whedon,
Editor ‹The Kearney Democrat.›

Kearns, Thomas, American politician: b. near Woodstock, Ont., 11 April 1862. He attended the public schools until his father's removal to Holt County, Nebraska, in 1872, then worked on the home farm till he was 14. After several years spent as a freighter in Nebraska he removed to Utah in 1883, where he worked at first as a miner, becoming subsequently one of the owners of the Mayflower and Silver King mines. He was a member of the common council of Park City, Utah, in 1895, and was a delegate to the National Republican convention the next year. He was also a delegate to the Philadelphia convention in 1900, and was elected a member of the United States Senate in 1901. He is largely identified with the mining interests of Utah and is one of the owners and projectors of the Salt Lake, San Pedro and Los Angeles railroad which runs from Salt Lake City, Utah, to Los Angeles, Cal.

Kearny, Lawrence, American naval officer: b. Perth Amboy, N. J., 30 Nov. 1789; d. there 29 Nov. 1868. Having entered the navy in 1807, he was active in the defense of the coast of South Carolina and States adjacent during the War of 1812, and in 1826 in command of the Warren effectually put an end to the depredations of the Greek pirates in the Levant. Promoted captain (1832), he was assigned (1841) to the command of the East India squadron, and began the negotiations for a commercial treaty between China and the United States, later concluded by the special envoy, Cushing. On his return voyage to the United States, Kearny stopped at the Hawaiian Islands to protest against the contemplated transfer of the islands to Great Britain. In 1867 he was made commodore on the retired list.

Kearny, Philip, American soldier: b. New York 2 June 1815; d. near Chantilly, Va., 1 Sept. 1862. He was graduated from Columbia in 1833, studied law, but in 1837 entered the United States army as lieutenant of the 1st dragoons, and in 1830–40 was in Europe for the study of the cavalry service of the French army, with which he fought in the Algerine war. In 1841 he was on the staff of Gen. Scott, in 1846 resigned from the army, but soon afterward enlisted for the Mexican War, fought at Contreras and Churubusco, and at the close of the latter engagement charged and pursued into Mexico

City the retreating enemy. He again resigned from the army in 1851, in 1859 entered the French service, and participated in the war in Italy, where he fought at Solferino. On 17 May 1861, he was appointed brigadier-general in the Union service, and given command of the 1st New Jersey brigade in the Army of the Potomac. Later he was assigned to the command of the cavalry of that army, and served conspicuously in the Peninsula. He was commissioned major-general of volunteers 7 July 1862, took part in the second Bull Run, and subsequently at Chantilly was shot while reconnoitering. Kearny was a brilliant cavalry leader, termed by Scott «the most perfect soldier» he ever knew. Consult: De Peyster, ‘Personal and Military History of Philip Kearny’ (1869).

Kearny, Stephen Watts, American general: b. Newark, N. J., 30 Aug. 1794; d. St. Louis, Mo., 31 Oct. 1848. He entered the United States army in 1812 as lieutenant, and distinguished himself in the action at Queenstown Heights in the same year. He served throughout the war, and became, in June 1846, a brigadier-general. At the commencement of the Mexican War he commanded the «Army of the West,» which marched from Bent's Fort on the Arkansas westward, and conquered New Mexico. Having established a provisional civil government in Santa Fé, he proceeded to California, and participated with his command in the battle of San Pascual, in December 1846. For his services in this campaign he was appointed brevet major-general, his commission being dated from the battle of San Pascual. He was governor of California from March to June 1847, but subsequently joined the army in Mexico, where he continued until the close of the war. He wrote: ‘Manual for the Exercise and Maneuvering of United States Dragoons’ (1837); ‘Organic Law’; ‘Laws for the Government of New Mexico’ (1846).

Kearny, N. J., town in Hudson County; on Newark Bay, between the Passaic and Hackensack rivers, and on the Pennsylvania, the Lehigh V., the Erie, and the Delaware, L. & W. R.R.'s; opposite the city of Newark. The first permanent settlement was made in 1765, by Germans, and the place was called New Barbadoes. Later it became a part of Harrison, but in 1871 it was incorporated and named in honor of Gen. Philip Kearny (q.v.) who once lived in the place, and whose residence still stands within the limits of the town. It has several manufacturing establishments, the chief of which are the Nairn Linoleum works with 1,200 employees; the Arlington Company Celluloid works, 1,000 employees; and the Marshall Thread Company, 2,000 employees. Other manufactures are golf balls, metal bedsteads, roofing material, and brass novelties. The town has a State Soldiers' Home, the Sacred Heart Industrial School for Boys, public and parish schools, and nine churches. In Arlington, or the third and fourth wards, there are many fine residences with large and well kept grounds. The government is vested in an alderman-at-large, practically a mayor without veto power, and a council of eight members, elected every two years. Pop. (1900) 10,896.

W. J. KEEGAN,
Editor of West Hudson ‘Press.’

Kearsarge, kĕr'särj, the name of two mountain peaks of the White Mountains. (1) Mount Kearsarge in Carroll County, N. H., is 3,260 feet in height. The Federal vessel which sank the Confederate cruiser Alabama was named after this mountain. (2) Kearsarge Mount, in Merrimac County, N. H., is 2,943 feet in height. This mountain was once called Kyar-Sarga.

Kearsarge, The, a ship of the United States navy which played a conspicuous part in the only sea-fight of the Civil War. See ALABAMA, THE.

Keary, kē'rĭ, **Annie,** English novelist: b. Bitton near Wetherby, Yorkshire, 3 March 1825; d. Eastbourne, Sussex, 3 March 1879. Beginning a literary career with books for children, she made her reputation with stories of Irish life and became very popular, ‘Castle Daly’ (1875) being her best work. Among other fictions by her are: ‘Clemency Franklyn’ (1866); and ‘A Doubting Heart,’ left unfinished at her death and completed by Mrs. Katharine Macquiod. She also published such historical works as ‘Early Egyptian History’; and ‘The Nations Around.’

Keary, Charles F., English novelist and antiquarian writer. He was educated at Cambridge University and beside the novels ‘A Mariage de Convenance’ (1889); ‘Herbert Vanlennert’ (1895); ‘High Policy’ (1902); etc., has published ‘Outlines of Primitive Belief’ (1882); ‘The Mythology of the Eddas’ (1882); ‘The Vikings in Western Christendom’ (1890); ‘Norway and the Norwegians’ (1892); ‘Riegel: an Autumn Mystery’ (1903).

Keasbey, kēz'bĭ, **Lindley Miller,** American political economist: b. Newark, N. J., 24 Feb. 1867. He was graduated from Harvard in 1888 and went abroad to study at Strasburg. He was appointed professor of political science at the University of Colorado in 1892, where he remained for two years, and in 1894 became professor in the same department at Bryn Mawr. He has written a number of monographs and magazine articles, also ‘The Nicaragua Canal and the Monroe Doctrine’ (1896); and has translated ‘The Economic Foundations of Society,’ from Loria.

Keats, kēts, **Gwendoline,** «ZACK,» English novelist: b. Devonshire. She first attracted notice by a series of dialect tales appearing in ‘Blackwood's Magazine,’ and in 1898 acquired sudden fame by her volume, ‘Life is Life,’ consisting of 12 stories delineating with skill and vigor the more painful and hopeless side of existence. Later books by her include: ‘On Trial’ (1899); ‘Tales of Dunstable Weir’ (1900); ‘The White Cottage’ (1901).

Keats, John, English poet: b. Moorfields, London, 31 (29?) Oct. 1795; d. Rome, Italy, 23 Feb. 1831. He studied in John Clarke's school at Enfield, was apprenticed (1810) for five years to a surgeon at Edmonton, broke his indentures (1814), continued his surgical studies in the London hospitals of St. Thomas' and Guy's, was appointed dresser at the latter (1816), but soon afterward relinquished his professional work, and turned to literature, aided by Leigh Hunt, who published some of his verse in the ‘Examiner.’ In 1817 appeared his volume ‘Poems, by John Keats,’ containing work of much promise, but quite unrecognized by the public. This he followed in 1818 by ‘Endymion,’ a volume whose obvious defects explained though they could not justify the bitter critical attacks in ‘Blackwood's Magazine’ (it is supposed by Lockhart) and the ‘Quarterly Review’ (by J. W. Croker), whose vulgar abuse was extreme even for those times. Keats continued his poetical work, however; collaborated with Charles Armitage Brown in the tragedy of ‘Otho the Great,’ and in 1820 published ‘Lamia, Isabella, the Eve of St. Agnes, and other Poems,’ on which volume his reputation as one of the great English poets is based. Already stricken with consumption, he sailed for Italy September 1820, and there died at Rome, where he was buried in the Protestant cemetery. His best work in its structure and content evinces an ease and a fulness of imagination similar to that of the great Elizabethans; and though he knew no Greek, he seized by intuition the Greek spirit. At times in his earlier experiments he is intricate, fantastic, and unhappy in diction. The best edition of his poems is by H. B. Forman (1889). Consult also: R. M. Milnes, ‘Life, Letters and Literary Remains of John Keats’ (new ed. 1867); Clarke, ‘Recollections of John Keats’ in ‘Recollections of Writers,’ by C. and M. C. Clarke (1878); the ‘Life’ by W. M. Rossetti (1887); and that by Colvin (1891) in the ‘English Men of Letters’ series; Gothein, ‘John Keats Leben und Werke’ (1897); H. C. Shelley, ‘Keats and His Circle’ (1902).

Keble, kē'bl, **John,** English Anglican clergyman and poet: b. Fairfield, Gloucestershire, 25 April 1792; d. Bournemouth, Hampshire, 29 March 1866. He was educated at Corpus Christi College, Oxford, and took his degree in 1811 with high honors. Going to Oriel as a fellow, he became college tutor and public examiner, and in 1831–41 was professor of poetry. He took priest's orders in 1816 and was his father's curate for some time. He was appointed vicar of Hursley, near Winchester, in 1836, a position which he held until his death. To the world at large he is best known as the author of the famous volume of religious verse, ‘The Christian Year’ (q.v.). He also wrote the ‘Lyra Innocentium,’ and, with Newman and others, the ‘Lyrica Apostolica.’ He was a zealous High Churchman, and wrote several of the celebrated ‘Tracts for the Times’ (1833). Keble College, Oxford, was founded as a memorial of him. Consult: ‘Lives’ by J. T. Coleridge (1869), and Lock (1892); Yonge, ‘Musings over the Christian Year’ and ‘Lyra Innocentium’; Shairp, ‘Studies in Poetry and Philosophy’ (1868); Newman, ‘Apologia pro Vita sua’ (1864); Yonge, ‘John Keble's Two Parishes’ (1898).

Keble College, one of the colleges of Oxford University, built by subscription as a memorial of the Rev. John Keble, and incorporated in 1870 by royal charter.

Ked'die, Henrietta, «SARAH TYTLER,» Scottish novelist: b. Cupar, Fifeshire, 4 March 1827. From 1848 to 1870 she was joint owner of a girls' school in her native place, and from 1870 to 1884 was engaged in literary work in London. She has since resided in Oxford. Her best work is ‘Citoyenne Jacqueline’ (1865), a well-told story of the French Revolution. Among other works of hers are: ‘Papers for Thoughtful Girls’ (1862); ‘St. Mungo's City’ (1885); ‘Six Royal Ladies of the House of Hanover’ (1898); ‘Women Must Weep’ (1901); ‘Three Men of Mark’ (1901).

Ked'ney, John Steinfort, American Episcopal clergyman: b. Essex County, N. J., 12 Feb. 1819. He was graduated from Union College in 1838 and from the General Theological Seminary, New York, in 1841. After taking orders in the Episcopal Church he was rector of several churches until 1871, when he became professor of divinity in Seabury Divinity School, Faribault, Minn. He has published: ‘Catawba River and Other Poems’ (1846); ‘The Beautiful and the Sublime’ (1884); ‘Hegel's Æsthetics’ (1886); ‘Christian Doctrine Harmonized’ (1888); ‘Mens Christi’ (1890); ‘Problems in Ethics’ (1899).

Keefer, kē'fėr, **Samuel,** Canadian engineer: b. Thorold, Ontario, 22 Jan. 1811. He is a brother of T. C. Keefer (q.v.). In 1841–53 he was chief engineer of the government board of public works, in 1853 was appointed resident engineer of the Grand Trunk railway, and in 1857–64 was government inspector of railways and deputy commissioner of public works. He completed in 1869 the Niagara Falls suspension bridge, then the longest existing single-span structure. His design and description of the bridge received a gold medal at the Paris exposition of 1878.

Keefer, Thomas Coltrain, Canadian engineer: b. Thorold, Ontario, 4 Nov. 1821. He is a brother of Samuel Keefer (q.v.). He was educated at Upper Canada College (Toronto), began practice as a civil engineer in 1838, and in 1850 was appointed by the government to survey the rapids of the St. Lawrence and explore the region between the headwaters of the St. John and the St. Lawrence. In 1851 he became engineer-in-chief of the Toronto and Kingston section of the Grand Trunk railway, and made surveys at Montreal for the present Victoria bridge across the St. Lawrence. He was chief commissioner for Canada at the Paris exposition of 1878. He wrote: ‘The Philosophy of Railways’ (1849); and an essay on ‘The Influence of the Canals of Canada on her Agriculture’ (1850), which won a prize offered by the Earl of Elgin.

Keeler, kē'lėr, **James Edward,** American astronomer: b. La Salle, Ill., 10 Sept. 1857; d. San Francisco, Cal., 12 Aug. 1900. He was graduated from the Johns Hopkins University in 1881, was appointed assistant to Prof. S. P. Langley (q.v.) in the Mount Whitney (Cal.) expedition (1881), was in 1881–3 at the Allegheny Observatory, and after study in Germany (1883–4), was appointed assistant at Lick Observatory (1886), and later astronomer there (1888). In 1891–8 he was active at the Allegheny Observatory as its director and professor of astrophysics in the Western University of Pennsylvania, and from 1898 until his death was director of the Lick Observatory. His spectroscopic work included valuable studies of the nebula in Orion and of Saturn's rings.

Keeley, kē'lĭ, **Leslie E.,** American physician: b. in 1842; d. Los Angeles, Cal., 21 Feb. 1900. He was graduated at Rush Medical College (Chicago) in 1863, was a surgeon in the Federal army during the Civil War, practised medicine at Dwight, Ill., there opened (1880) a sanitarium for the cure of inebriety and the use of narcotics, and later established branches. His system was based on a secret compound said by him to contain bichloride of gold, and hence called the «gold» cure. He published ‹The Morphine Eater› (1881).

Keely, John Ernest Worrell, American adventurer: b. Philadelphia, Pa., 3 Sept. 1837; d. there 18 Nov. 1898. In early life he was a carpenter. Prior to 1872 he became interested in music, and afterward claimed that the tuning-fork had suggested to him a new motive power. In 1874 a stock company was formed for the purpose of supplying funds for the perfection and promotion of the alleged discovery. Keely built and destroyed many models, gave exhibitions at which numerous remarkable and unexplained effects were produced, but never attained any important result. Upon his death it was found that the so-called Keely motor was operated by an invisible compressed-air apparatus, and that the entire scheme was fraudulent.

Keely Motor. See KEELY, J. E. W.

Keen, kēn, **William Williams,** American surgeon: b. Philadelphia 19 Jan. 1837. He was graduated at Brown University in 1859, and from Jefferson Medical College in 1862; and during the Civil War period was an assistant surgeon in the Federal army. He then studied in Europe 1864–6, was at the head of the Philadelphia School of Anatomy 1866–75; and at the same time lecturer on pathological anatomy at Jefferson Medical College. From 1875 to 1890 he was professor of artistic anatomy at the Pennsylvania Academy of Fine Arts and also of surgery at the Women's Medical College 1884–9, and of surgery at Jefferson Medical College. His specialty was the surgery of the nervous system. In 1890 he published experiments with the injection of filtered air for determination of rupture of the bladder and in 1891 proposed relieving spasmodic wryneck by the exsection of the nerves supplying the posterior rotator muscles of the head. He has published: ‹Keen's Clinical Charts› (1870); ‹Early History of Practical Anatomy› (1870); etc., and became honorary fellow of the Royal College of Surgeons of England in 1900.

Keenan, kē'nan, **Henry Francis,** American novelist: b. Rochester, N. Y., 4 May 1850. He served in the Federal army during a portion of the Civil War, and was engaged in journalistic work 1868–82. He has published: ‹The Money Makers: a Social Problem›; ‹Trajan›; ‹The Aliens›; ‹The Iron Game›; ‹The Players.›

Keene, kēn, **James Robert,** American stock speculator: b. London, England, 1838. He went to California in 1852, was a miner in that State and Nevada, later was a speculator in mining stock at San Francisco, during the so-called «bonanza» period acquired $6,000,000, and for a time was president of the San Francisco stock exchange. In 1877 he established himself in New York as a Wall Street operator, soon became known for his energetic manipulations on 'Change, and since then has lost and made several fortunes.

Keene, Laura, American actress and manager: b. England 1820; d. Montclair, N. J., 4 Nov. 1873. Her real name was Mary Moss, and as «LAURA KEENE» she had become famous in England in the role of Pauline in ‹The Lady of Lyons› before coming to the United States in 1852, where she made her home the remainder of her life. She was for a time manager of the Varieties Theatre in New York, and 1855–63 was lessee of the Olympic, at first called «Laura Keene's Theatre.» She was married to H. W. Taylor in 1847, and to J. Lutz ten years afterward. The most noted play produced by her was ‹Our American Cousin,› brought out in 1858 with Jefferson and Sothern in the cast. While he was witnessing this play at Ford's Theatre in Washington, President Lincoln was assassinated.

Keene, N. H., city, county-seat of Cheshire County; on the Ashuelot River, and on the Boston & M. and the Fitchburg R.R.'s; about 45 miles southwest of Concord and 43 miles west of Manchester. Mount Monadnock is 10 miles from the city. The city, known as Upper Ashuelot, was settled in 1734 and incorporated in 1753 when it took the name of Keene. It received its city charter in 1874. The chief industrial establishments are the repair-shops of the Boston & Maine railroad, sash, door, and blind factories, furniture, pail and tub, and chair factories, glue works, pottery, woolen-mill and shoe factory. Nearly 2,000 persons are employed in the factories. The annual output of manufactured goods is about $2,000,000. The products of the fertile farms of the vicinity add to the wealth of the city. Pop. (1890) 7,446; (1900) 9,165.

Keener, kē'nėr, **John Christian,** American Methodist bishop: b. Baltimore 7 Feb. 1819. After entering the Methodist ministry in 1841 he preached in Alabama till 1848 and was pastor and presiding elder in New Orleans 1848–61. He edited the ‹New Orleans Christian Advocate› (1865–70), and in the year last named was appointed a bishop of the Methodist Church, South. He has published: ‹Studies of Bible Truths› (1899); ‹The Garden of Eden and the Flood› (1900).

Keesoo, or **Teesoo,** the flowers of certain species of *Butea* (q.v.).

Keewatin, kē-wä'tĭn, a district of Canada lying west and south of Hudson Bay, and extending from Ontario and Manitoba north to the Arctic Ocean. Its area is 756,000 square miles. The greater part of the surface is hilly and somewhat mountainous, but there are no high peaks or ranges. The northern part of Lake Winnipeg and its outlet, Nelson River, are in Keewatin. There are a large number of small lakes, all of which belong in the basin of Hudson Bay. The Severn, Churchill, and Ferguson rivers cross the district and enter Hudson Bay. There is considerable fertile land, but the climate is too cold for luxuriant vegetation. In the south there are large forests of pine, spruce, and other trees. Some valuable minerals have been found, gold and copper, but the mines have not been developed. Hunting, lumbering, and fishing are the chief occupations. The inhabitants of the north are chiefly Eskimos. York Factory, at the mouth of the Nelson River, Fort Churchill, at the mouth of the

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HELEN KELLER, HER INSTRUCTOR AND JOSEPH JEFFERSON.

Churchill River, Norway House, on Lake Winnipeg, and a number of other places in Keewatin are trading stations of the Hudson Bay Company and its successors in the fur business of Canada. All are small settlements. The fisheries at Lake Winnipeg attract a colony a part of the year.

The name of the district comes from the Indian word kewatin, which means «northwest wind.» The lieutenant-governor of Manitoba is the chief executive of this territory, and has had control since the erection of the district, 12 April 1876.

Keifer, kī'fėr, **Joseph Warren,** American politician: b. Clark County, Ohio, 30 Jan. 1836. He was graduated from Antioch College; and in 1856 went to Springfield, Ohio, where he studied law, being admitted to the bar in 1858. At the outbreak of the Civil War he entered the volunteer service as major and rose to the rank of major-general; he was four times wounded; in 1866 he declined an appointment as lieutenant-colonel in the United States army. He was a member of the Ohio State senate in 1868–9; was delegate to the Republican national convention in 1876, and was elected to Congress in that year, serving till 1885; while from 1881 to 1883 he was speaker of the House. Since 1873 he has been president of the Lagonda National Bank in Springfield; he has also been prominent in the Grand Army, being department commander in Ohio (1868–70) and vice-commander-in-chief of the national organization in 1871–2. In 1898 he served as major-general of volunteers in the Spanish War, his command being located near Havana. He has written ‘Slavery and Four Years of War’ (1900).

Keith, kēth, **George,** Scottish Quaker: b. probably in Aberdeenshire about 1639; d. Edburton, Sussex, England, 27 March 1716. He was educated at Marischal College, Aberdeen; became a Quaker in 1662, and in 1677 he accompanied George Fox and William Penn to Holland on a missionary journey; came to Philadelphia in 1689; and was there accused of heresy and interdicted from preaching in 1692. He then held separate meetings of his followers, known first as Keithites and later as «Christian Quakers.» Disowned by the yearly meeting of 1694, he established a congregation in which the Quaker externals were observed but the Lord's Supper and baptism were administered. In 1700 he conformed to the Anglican Church, in 1702–4 was a missionary in America for the Society for the Propagation of the Gospel, and from 1705 until his death was rector of Edburton, Sussex. Among his writings were: ‘The Deism of William Penn and his Brethren’ (1699); ‘The Standard of the Quakers Examined’ (1702); and ‘A Journal of Travels’ (1706).

Keller, kĕl'ler, **Gerard,** Dutch writer: b. Gouda, 13 Feb. 1829. His best works are his books of travel, including: ‘A Summer in the North’ (1861); ‘A Summer in the South’ (1864); ‘Paris Besieged’ (1871); ‘Murdered Paris’ (1872); ‘Europe Sketched in All her Glory’ (1877–80); ‘America in Image and in Writing’ (1887). Among his numerous novels may be named: ‘Within and Without’ (1860); ‘From Home’ (1867); ‘Over-Perfect’ (1871); ‘The Privy Councillor’; ‘In Our Days’ (1880); ‘Our Minister’ (1883); ‘Flickering Flames’ (1884); ‘Nemesis’ (1885). He is the author also of books for the young, and several dramas.

Keller, Gottfried, German poet and novelist: b. Zürich 19 July 1819; d. there 16 July 1890. Original in execution, he was a keen observer, genuinely artistic, and with a strong sense of humor, sometimes extravagantly indulged. In his best vein he goes straight to the heart. To romanticism in *motifs,* processes, and characters, he joined realism in execution. Among his works may be cited: ‘Der grüne Heinrich’ (1854, 16th ed. 1897), his first novel; ‘Seldwyla Folk,’ a collection of short stories (1856); ‘Romeo und Julie auf dem Dorfe’ (1876); ‘Martin Salander’ (1886). His collected poems appeared in 1883. By critics Keller is ranked among the best of German novelists. Consult: Brahm, ‘Gottfried Keller’ (1883); Köster, ‘Gottfried Keller’ (1900).

Keller, Helen Adams, American blind, deaf and dumb girl who has been successfully educated: b. Tuscumbia, Ala., 27 June 1880. When about two years old, she was deprived of sight and hearing by a severe illness. Her education was not begun till she was seven, when Miss Anna Sullivan of the Perkins Institute of the Blind, went to her home to take charge of her. She learned the deaf and dumb language by touch, learned to read by the braille system, and to write, using a special typewriter; in 1890, she also learned to speak. When 12 years old, she went to Boston, where she has since lived; in 1896 she entered the Cambridge School for Young Ladies to prepare for college. Miss Sullivan went with her to all classes, and repeated the lectures and discussions by touch. In 1900 she entered Radcliffe College, and was graduated with honors in 1904. The work of her college course was done with aid of Miss Sullivan, as in the preparatory school; the textbooks were printed in braille; she wrote her examinations with her own typewriter; and had special conferences with her instructors instead of taking part in recitations. In addition to doing the full college work, she took part in the social life, and was very popular with her classmates. She has written her autobiography under the title of ‘Story of My Life’ (1903).

Kellermann, François Christophe, fräṅ swä krēs-tōf kĕl'lėr-män (originally Georg Michael Kellermann), Duke of Valmy, French marshal: b. Wolfsbuchweiler-an-der Tauber, Bavaria, 28 May 1735; d. 12 Sept. 1820. He entered the Conflans Legion as a hussar in 1752, and engaged in the first campaigns of the Seven Years' War. In 1792 he received the command of the army of the Moselle, formed a junction in September with the main army under Dumouriez, and sustained 20 Sept. 1792 the celebrated attack of the Duke of Brunswick. In the following wars of France Kellermann received various general commands. He became marshal of France in 1804 and Duke of Valmy in 1809. After the Bourbon restoration he was appointed a member of the chamber of peers, where he espoused the Liberal side.

Kelley, kĕl'ĭ. **Benjamin Franklin,** American soldier: b. New Hampshire, N. H., 10 April

1807; d. Oakland, Md., 17 July 1891. In 1861 he recruited and became colonel of the first Virginia regiment enlisted in the Federal service, on 17 May became brigadier-general, captured Romney 26 October and was for a time, until January 1862, commander of the department of Harper's Ferry and Cumberland. In July 1863, he was appointed to command the department of West Virginia, in November 1863 destroyed the Confederate camp near Morefield, Va., and in August 1864 defeated the enemy at Cumberland, Md., and New Creek and Morefield, Va. He was brevetted major-general of volunteers in 1865, and subsequent to the war was from 1876 superintendent of the Hot Springs (Ark.) reservation, and from 1883 an examiner of pensions.

Kelley, Edgar Stillman, American composer: b. Sparta, Wis., 14 April 1857. He was graduated from the Stuttgart Conservatory of Music in 1880, and returning to this country settled in San Francisco, composing there incidental music to ‹Macbeth.› He removed later to New York, where he became special instructor in composition in the New York College of Music, and where his opera, ‹Puritana,› was produced in 1892. He has also composed an orchestral suite ‹Aladdin› symphony; music to ‹Prometheus Bound›; music for dramatic production of ‹Ben Hur› (1899); etc.

Kelley, James Douglas Jerrold, American naval commander: b. New York 25 Dec. 1847. He was graduated from the United States Naval Academy in 1868; became lieutenant-commander in 1893 and commander in 1899. He has published: ‹The Question of Ships›; ‹Our Navy›; ‹American Men-o'-War›; ‹History of the Naval Experimental Battery›; ‹The Navy of the United States›; and is the naval editor of the New York *Herald.*

Kelley, William Darragh, American legislator: b. Philadelphia, Pa., 12 April 1814; d. Washington, D. C., 9 Jan. 1890. He was apprenticed first to a jeweler and later to a printer, studied law at Philadelphia and in 1841 was admitted to the bar there, in 1845–6 was attorney-general of Pennsylvania, and in 1846–56 judge of the court of common pleas at Philadelphia. Previously a Democrat, he became a Republican in 1854, and in that year gave at Philadelphia a once well-known address on ‹Slavery in the Territories.› In 1860 he was a delegate to the national Republican convention, and from that year until his death was a member of the House of Representatives, where he was chairman of the Committee on the Centennial Exposition and was known as «Pig-iron Kelley.» For some years he was senior of the House. Among his publications are: ‹Letters on Industrial and Financial Questions› (1872); ‹Letters from Europe› (1880); ‹The New South› (1887).

Kellogg, kĕl'ŏg, **Amas Monkham,** American educator: b. Utica, N. Y., 5 June 1832. He was graduated from the Albany (N. Y.) State Normal School in 1851 and was instructor there 1852–6. Since then he has held other educational posts and has edited the ‹School Journal› from 1874. He has published: ‹School Management›; ‹Life of Pestalozzi› (1891); ‹How to be a Successful Teacher› (1901), etc.

Kellogg, Clara Louise, American opera singer: b. Sumterville, S. C., 12 July 1842. She obtained her musical education chiefly in New York, where her first appearance in opera was in 1861 at the Academy of Music, in the role of Gilda in ‹Rigoletto.› Henceforward she was one of the most popular of American singers, and was also most cordially received in England, where she sang in opera 1867–8 and again in 1872 with Christine Nilsson. Her voice was a pure and flexible soprano and her execution brilliant. She had an extensive repertoire, including 45 operas. In 1874 she organized an English opera company and with it visited nearly every part of the United States. In 1876 she organized an Italian opera company and later appeared on the concert stage. In 1887 she married her manager, Carl Strakosch, and soon after retired from professional life.

Kellogg, Edgar Romeyn, American soldier: b. New York 25 March 1842. He served through the Civil War in the Federal army, and was distinguished for bravery at Murfreesboro, during the Atlanta campaign, and at Jonesboro. He commanded the 10th United States Infantry at the battle of San Juan Hill, Cuba, 1 July 1898, and was appointed brigadier-general, United States army in the following October.

Kellogg, Elijah, American Congregational minister and writer for the young: b. Portland, Maine, 20 May 1813; d. Harpswell, Maine, 17 March 1901. He was graduated from Bowdoin College in 1840, from the Andover Theological Seminary in 1843, was pastor of the Congregational Church at Harpswell, Maine, in 1844–55, in 1855–65 was chaplain of the Boston (Mass.) Seamen's Friend Society, was later for a time in charge of a congregation at Rockport, Mass., but soon returned to Harpswell, and there devoted himself to literary work. He published over a score of juveniles, including ‹The Elm Island Series› (1868–70); ‹Pleasant Cove Series› (1870–4), and ‹Good Old Times Series› (1877–82). But he is best known for his familiar blank verse addresses, ‹Spartacus to the Gladiators,› ‹Regulus to the Carthaginians,› and ‹Pericles to the People.› Consult Mitchell, ‹Elijah Kellogg: the Man and His Work› (1903).

Kellogg, George, American inventor: b. New Hartford, Conn., 19 June 1812; d. there 6 May 1901. Albert Kellogg, the botanist (q.v.), was his brother. He was graduated from Wesleyan University in 1837, in 1841 became a manufacturer in Birmingham, Conn., removed in 1855 to New York, was a United States revenue officer in 1863–6, and later was active in manufacturing and experimentation at Cold Spring, N. Y. Among his inventions were a machine for the manufacture of jack-chain, with a capacity of a yard per minute; a type-distributer; an adding apparatus; and a dovetailing machine.

Kellogg, Martin, American Latinist and educator: b. Vernon, Conn., 15 March 1828; d. San Francisco 26 Aug. 1903. He was graduated from Yale in 1850, from the Union Theological Seminary in 1854; having removed to California about 1855 there held a pastorate at Grass Valley, Nevada County; was professor of Latin and mathematics in the College of California (1860–9); and when the college was merged into the university held the chair of Latin and Greek in the latter institution in 1869–76. In 1876–94 he was professor of Latin language and literature, in 1890–3 acting president, and in 1893–9 president of the university. He resumed his professional duties in 1900. He published: ‘Ars Oratoria,’ an edition of selections from Cicero and Quintilian (1872), and ‘The Brutus of Cicero’ (1889).

Kellogg, Samuel Henry, American Presbyterian missionary and scholar: b. Quogue, Long Island, N. Y., 6 Sept. 1839; d. Landour, India, 2 May 1899. He was graduated at Princeton College in 1861 and at the Theological Seminary in 1864, and after being ordained to the Presbyterian ministry, went as a missionary to India, where he remained till 1877. He was professor of systematic theology in Western Theological Seminary 1877–86, and pastor of St. James' Square Presbyterian Church, Toronto, 1886–92. He returned to India in 1892 and remained there till his death. His publications include ‘A Grammar of the Hindi Language’ (1876); ‘The Jews: or, Prediction and Fulfilment’ (1883); ‘The Light of Asia and the Light of the World’ (1885); ‘The Genesis and Growth of Religion’ (1892); ‘From Death to Resurrection’ (1885); etc.

Kellogg, William Pitt, American lawyer and politician: b. Orwell, Vt., 8 Dec. 1831. He was educated at the Norwich Military Institute and removed to Illinois, where he studied law. Being admitted to the bar in 1852 he began his practice at Canton. He became active in the Republican party, was a delegate to the national convention in 1860, and one of the presidential electors in the same year, voting for Lincoln. In 1861 the President appointed him chief justice of the Territory of Nebraska, but later granted him leave of absence that he might raise a regiment of cavalry in Illinois, of which he became colonel. He remained in the army two years, serving in the Missouri campaign with Pope, but was compelled to resign on account of ill health. He was collector of the port at New Orleans (1865–8); was elected senator from Louisiana in 1868; was then elected governor of the State in 1873, serving till 1876, when he was again elected senator. At the expiration of his term as senator he was elected to the House of Representatives, where he remained till 1885. He has been a delegate to every Republican national convention from 1860 to 1896.

Kel'ly, Edmond, American municipal reformer: b. Toulouse, France, 28 May 1852. He was educated in early years in England and after graduation at Columbia Law School in 1877, was called to the bar. In 1884 he was admitted to the French bar and practised in Paris till 1890, and was counsel for the American legation at Paris. He has been conspicuous in recent efforts to improve the municipal administration of New York. He is the author of ‘Evolution and Effort, and their Relation to Religion and Politics’ (1898); and ‘Government; or, Human Evolution’ (1901).

Kelly, James Edward, American sculptor: b. 30 July 1855. He studied at the National Academy of Design, and up to 1881 was known as an illustrator of books and magazines. Since that time he has successfully devoted himself to sculpture, and chosen subjects from American history for treatment by his patriotic chisel; so great has been his success that he has won the title of «Sculptor of American History.» His well known works include ‘Sheridan's Ride’ (1878); ‘Paul Revere,’ a statuette (1882); ‘Monmouth Battle Monument,’ with five illustrative panels (1883–5); groups for the ‘Saratoga Monument’ (1887); ‘Grant at Fort Donelson’ (1886); ‘General Devens’ and the ‘Sixth New York Cavalry Monument’ at Gettysburg (1890); ‘Call to Arms’; colossal figure for the Troy ‘Soldiers' Monument’ (1891); ‘Buford Monument’ at Gettysburg (1895); ‘Battle of Harlem Heights’ (executed for the Sons of the Revolution at Columbia University, 1897); and a colossal monument to commemorate the defense of New Haven. A remarkable series of military portraits has also been produced by him. Forty generals of the Civil War, including Grant, Sherman and Sheridan, gave sittings for the sculptor. A series illustrating the leading generals and admirals of the Spanish-American War has followed, witnessing to his skill and industry as a portrait sculptor. Wheeler, Dewey, and Sampson are included in this latter gallery of busts.

Kelly, John, American politician: b. New York 21 April 1821; d. there 1 June 1886. After a public school education, he was apprenticed to the mason's trade, in 1845 established a successful business of his own, was elected alderman in 1854, in 1855–9 was a Democratic representative from New York in the 34th and 35th Congresses, and in 1859–62 and 1865–7 was sheriff of New York County. In 1868 he was the candidate of the Democratic Union for mayor, but was defeated by Oakey Hall; and in 1871 assisted Charles O'Conor, Samuel J. Tilden and others in the reorganization of Tammany Hall which followed the Tweed «ring» troubles. He became comptroller of New York in 1876, but was removed in 1879 by Mayor Cooper. In 1878 he caused the city delegates to bolt the Democratic State convention of that year, and was himself nominated for governor by the bolters on an independent ticket in opposition to Robinson, the regular candidate. He received 77,566 votes, and thus caused the election of Alonzo B. Cornell, Republican. In 1885 and 1886 he was chairman of the Tammany Hall general committee. See TAMMANY HALL.

Kelly, William, American inventor: b. Pittsburg, Pa., 22 Aug. 1811; d. Louisville, Ky., 11 Feb. 1888. He early turned his attention to invention, engaged in the forwarding and commission business at Pittsburg, Pa., and from 1846 in the iron business in Kentucky. In 1851 he finally perfected his process in decarbonizing iron by means of a current of air, and thus by a converter directly transforming pig-iron into steel. This method, «Kelly's air-boiling process,» was the same as that patented by Sir Henry Bessemer in England in 1856 (or 1857), and Kelly asserted that Bessemer had gained knowledge of it through American workmen. Bessemer's application in the United States was refused, and the patent awarded to Kelly. Kelly's interests were safeguarded by a syndicate, and steel was first manufactured under his patents in the foundry at Wyandotte, Mich. He is said to have introduced Chinese labor into the United States.

Kelly's Ford, Engagements at. This point on the Rappahannock River six miles above its junction with the Rapidan and about five miles below Rappahannock Station, was the scene of several engagements between the Federals and Confederates during the Civil War. In August 1862, the Union cavalry of the Army of Virginia had a spirited encounter with the Confederate cavalry, and 17 March 1863 Gen. Averell with 2,100 Union cavalry and a battery of six guns, crossed at the ford, after a sharp engagement, and moved on Culpeper Court House, under orders to rout and destroy Fitzhugh Lee's cavalry brigade, reported at that place. Lee was found in his immediate front with five regiments and a battery, and when about noon Averell advanced, a hard fight ensued, during which Lee was gradually forced back over a mile; then Averell was checked, finally driven back, and recrossed the river at dark. It was the first purely cavalry battle of the War, and was closely contested on both sides. The Union loss was 65 killed and wounded and 22 missing; the Confederate loss, 99 killed and wounded and 34 missing. Among the Confederate killed was Captain John Pelham, a young artillerist of much promise. A portion of Pleasanton's cavalry division crossed the ford and took part in the battle of Fleetwood (q.v.) 9 June 1863. When Gen. Meade began his Mine Run campaign (see MINE RUN) two corps of the Army of the Potomac under Gen. Sedgwick forced the passage of the Rappahannock at the railroad crossing, 7 Nov. 1863, while Gen. French, with two corps, forced the passage at Kelly's Ford, five miles below. The advance of the Third corps crossed with a loss of 36 killed and wounded, the Confederate loss being 64 killed and wounded and 295 captured, and the Army of the Potomac was united at Brandy Station. Preceding and following these engagements the ford was the scene of many stirring events.

E. A. CARMAN

Kelp, any of several large broad-leaved fucoid seaweeds (q.v.), which are burned for making ash and used for other purposes. The ash is known as «kelp» (or in France as *varec*), and was formerly produced in large quantities by slowly charring several tons of the weed in a shallow pit. The yield in ash was about 5 per cent of the weight of the mass burned. This crude ash contains several salts, especially carbonates and sulphates of sodium and potassium, with other substances in smaller proportions. It used to be the principal source of soda and iodine, but these substances are now otherwise obtained, and the making of kelp-ash has ceased to be profitable.

Kelp-crab, a large squarish edible crab (*Epialtus productus*), numerous in rocky weed-covered places along the Pacific coast from Monterey to Puget Sound.

Kelp-fish, a large blenny (*Heterostichus rostratus*) of the Californian coast, which is sold for food in the local markets. It is reddish brown, much streaked and mottled, so that it is practically invisible among the sea-weeds (kelp) where it usually lurks. Many other more or less similar fishes are called kelp-fishes in other parts of the world.

Kel'tie, John Scott, Scottish geographer: b. Dundee, Scotland, 29 March 1840. He has been editor of the ‹Statesman's Year Book› from 1880, is editor of the ‹Geographical Journal,› and has writen extensively on geographical and scientific topics in newspapers and periodicals. He has published ‹History of Scottish Highlands and Clans› (1874); ‹Report on Geographical Education› (1886); ‹Applied Geography› (1890); ‹The Partition of Africa› (1894). He is a member of geographical societies all over the world.

Kel'ton, John Cunningham, American soldier: b. Delaware County, Pa., 1828. He was graduated at West Point in 1851, received the commission of lieutenant in the infantry and served for six years in the frontier garrisons of Minnesota, Kansas and Dakota. At the conclusion of that period he was ordered to West Point as instructor in the use of small arms. During the Civil War he returned to active service and in 1861 became purchasing agent for the Western Department. The same year he was put in command of the 9th Missouri volunteers, with the commission of colonel. In 1862 he was appointed to the staff of Major-General Halleck, as assistant adjutant-general, and in 1865 brevetted brigadier-general in the regular army. He was appointed after the war a staff colonel and assistant adjutant-general at Washington; and invented improvements in military firearms which met with the acceptance of the Ordnance Department. Among his works on military subjects may be mentioned a ‹Manual of the Bayonet› (1861).

Kelts. See CELTS.

Kel'vin, Lord. See THOMSON, SIR WILLIAM.

Kem'ble, Adelaide. See SARTORIS, ADELAIDE KEMBLE.

Kemble, Charles, English actor, 11th child of Roger Kemble (q.v.), and younger brother of John Philip Kemble (q.v.): b. Brecon, South Wales, 25 Nov. 1775; d. London 12 Nov. 1854. He was educated at the English Roman Catholic College at Douay, France, and in 1794 made his first appearance at Drury Lane as Malcolm to his brother's Macbeth. In 1800 he produced at the Haymarket Theatre his adaptation of Mercier's ‹Deserteur,› under the title of ‹The Point of Honor,› which achieved considerable success. In 1807 his play of ‹The Wanderer,› adapted from Kotzebue, and in 1808 his farce of ‹Plot and Counterplot,› were both successfully brought on the stage. As an actor he gained special celebrity by the performance of such characters as Falconbridge, Edgar, Romeo, Charles Surface, Cassio, Don Felix, and Benedick. His impersonations were greatly heightened by the physical advantages which he possessed of a fine voice, handsome features, and a tall athletic figure. About 1840 he was appointed to the office of examiner of plays, and shortly afterward made his last appearance on the stage. He subsequently gave occasionally public readings from Shakespeare. He was the father of John Mitchell Kemble (q.v.), the philologist, and of Fanny and Adelaide Kemble (q.v.). Consult Fitzgerald, ‹The Kembles› (1871).

Kemble, Elizabeth. See WHITLOCK, ELIZABETH KEMBLE.

Kemble, Frances Anne, English actress and author, daughter of Charles Kemble (q.v.): b. London 27 Nov. 1809; d. there 16 Jan. 1893. She manifested no special predilection for the stage, but made her début at Covent Garden, then under the management of her father, in October 1829. On this occasion she played Juliet, her father taking the part of Romeo, and her mother that of the nurse, with complete success. For the three succeeding years she performed leading parts in tragedy and comedy with great applause, distinguishing herself particularly in Juliet, Portia, Bianca in Milman's 'Fazio,' Julia in the 'Hunchback' (the latter being originally personated by her), Belvidera, Isabella, Lady Teazle, and Louise de Savoy, in her own play of 'Francis the First,' written when she was 17, and received with approbation. In 1832 she accompanied her father to the United States, and met with an enthusiastic reception in the chief cities. In 1834 she was married to Pierce Butler, a Georgia planter, and retired from the stage. The union proving unhappy, a separation took place at the end of a few years, and Mrs. Butler fixed her residence in Lenox, Mass. In 1849 she secured a divorce and resumed the name of Kemble. Her first work in prose, 'A Journal of a Residence in America' (1835) was chiefly devoted to a description of her tour through the United States. It was followed in 1837 by a drama, 'The Star of Seville,' acted with success; and in 1844 appeared a collection of her poems. Later works were 'A Year of Consolation' (1847); 'Residence on a Georgia Plantation' (1863); 'Record of a Girlhood' (1878–9); 'Records of Later Life' (1882); 'Notes upon Some of Shakespeare's Plays' (1882); 'Poems' (1883); 'Far Away and Long Ago,' a story (1889); 'Further Records' (1891). In the winter of 1848–9 she commenced in Boston a series of Shakespearian readings which drew crowded audiences, and during the next two years repeated the course in some of the principal American cities. In 1851 she returned to England, reappeared for a brief period on the stage, and gave readings in London and other parts of the United Kingdom. In 1856 she returned to the United States, and continued for several years at intervals to give readings in Boston and elsewhere. Her grandson, Owen Wister (q.v.) is a well known American writer.

Kemble, George Stephen, English actor: b. Kington, Herefordshire, 3 May 1758; d. 5 June 1822. He was a son of Roger Kemble (q.v.) and in 1783 made his début in London at Covent Garden Theatre as Othello. In the latter part of his career his increasing bulk enabled him to play the part of Falstaff without resort to padding. He was at various times theatrical manager in London, Edinburgh, and Glasgow.

Kemble, John Mitchell, English Anglo-Saxon scholar: b. London 2 April 1807; d. Dublin 26 March 1857. He was educated at Trinity College, Cambridge, and having early directed his attention to Anglo-Saxon language and history, employed himself in the ancient MSS. in the libraries of the university. The first fruits of his researches appeared in 1833, in the publication of the Anglo-Saxon poem 'Beowulf,' in 1834, and issued a pamphlet on the 'History of the English Language, First or Anglo-Saxon Period.' He edited in seven octavo volumes, for the English Historical Society, a collection of all the known charters of the Anglo-Saxon period, under the title of 'Codex Diplomaticus Ævi Saxonici,' and in 1849 appeared his most valuable and best known work, 'The Saxons in England.' Kemble was for many years editor of the 'British and Foreign Review,' and in 1840 succeeded his father, Charles Kemble (q.v.), as censor of plays, which office he occupied till his death.

Kemble, John Philip, English tragedian, eldest son of Roger Kemble (q.v.): b. Prescott, Lancashire, 1 Feb. 1757; d. Lausanne, Switzerland, 26 Feb. 1823. He was educated at the Roman Catholic seminary of Sedgley Park, Staffordshire, and the College of Douay, France, where he early distinguished himself by his proficiency in elocution. On his return to England he entered immediately upon the profession of an actor, and appeared for the first time in London at Drury Lane, 30 Sept. 1783, in the part of Hamlet, and was received with great applause. It was not, however, till 1788 that he took a decided lead in tragedy. He afterward obtained the management of Drury Lane Theatre, where his sister, Mrs. Siddons (q.v.), was the leading actress. In 1794 he brought out a musical entertainment of his own, entitled 'Lodoiska,' which had a great run. In 1802 he became manager of the Covent Garden Theatre, where he continued his career with great success till the destruction of the theatre by fire in 1808. In the autumn of 1809 the new edifice which had been constructed opened with an increase of prices, which, with certain obnoxious arrangements in regard to the private boxes, created for a series of nights the disturbances known by the name of the O. P. riots. Kemble retired from the stage 23 June 1817. As an actor he was distinguished for dignity, precision, and studious preparation. His merits were differently appreciated, but by all he was regarded as a highly gifted actor, and the impressions made in characters more immediately adapted to his style of excellence, such as Cato, Coriolanus, Hamlet, John, Jaques, Penruddock, was very great. See Boaden, 'Memoirs of the Life of John Philip Kemble' (1825).

Kemble, Roger, English actor and theatrical manager: b. Hereford 1 March 1721; d. 6 Dec. 1802. John Philip Kemble (q.v.) and Mrs. Siddons (q.v.) were his children. He organized in 1753 a traveling company in which many members of his family appeared. In 1788 he appeared at the Haymarket as Falstaff and the Miller in 'The Miller of Mansfield,' when, although rated as a mediocre actor, he is said to have played "with very superior effect."

Kemeys, Edward, American sculptor: b. Savannah, Ga., 31 Jan. 1843. He was educated in New York and served in the Civil War as captain in the artillery. He resigned in 1866 and went west, where he saw something of Indian life, and became familiar with the habits and forms of big game. He returned to New York and worked as a civil engineer in the laying out of Central Park, but did not seriously choose the profession of art until 1870, when he resolved to become a sculptor. He went abroad in 1877 and his exhibits in Paris and London attracted attention, especially his 'Fight between a Buffalo and Wolves' in the Salon of 1878. He has made American wild animals his specialty. He is in short the American Barye; his ‘Panther and Deer,’ his ‘Coyote and Raven,’ are noteworthy for their fidelity to nature and life-like expression, and he is also remarkably successful in his figures of the North American Indian.

Kem'nitz, Martin. See CHEMNITZ, MARTIN.

Kempe, Charles Eamer, English worker in stained glass: b. Ovingdeane, Sussex, 29 June 1837. He received his early education at Rugby, and was graduated at Oxford University. His principal works have been in stained glass of the 13th century style in which the color, drawing and expression are of a unique excellence. He is distinctly a religious painter, who choosing as his medium the most difficult and intractable of methods and materials, has achieved supreme artistic and devotional success. His principal production in this country is the remarkable Jesse window in the Church of the Advent, Boston, which bears comparison with the more famous Jesse window of Troyes, France. He has designed and executed many fine windows for the cathedrals of Lichfield and Durham, and the ‘Jane Austen’ window recently set up in Winchester Cathedral is one of his latest creations.

Kem'per, James Lawson, American soldier and politician: b. Madison County, Va., 11 June 1823; d. Orange County, Va., 7 April 1895. Graduated from Washington College (Lexington, Va.) in 1842, he studied law at Charlestown (Va.), served in the Mexican War as captain of volunteers, and for ten years was a representative in the Virginia legislature, during two of which he was speaker of the house. In 1861 he was appointed colonel of the 7th Virginia, C. S. A.; in 1862 fought at Fair Oaks (31 May–1 June), where he was commissioned brigadier-general; and later also at Frayser's Farm (30 June), South Mountain (14 September), Antietam (16–17 September); and Fredericksburg (13 December). He was severely wounded at Gettysburg, was subsequently detailed to command the forces in and about Richmond, and 1 March 1864 was promoted major-general. After the war he practised law in Madison County, was Democratic governor of the State in 1874–8 and at the close of his term became a planter in Orange County. He published a collection of messages to the State legislature (1876).

Kemper, Reuben, American soldier: b. Fauquier County, Va., 1770; d. Natchez, Miss., 10 Oct. 1826. He emigrated to Ohio in 1800, and subsequently removed with two of his brothers to the Territory of Mississippi, where they were leaders in the movement to rid West Florida of Spanish rule. The Spanish authorities caused the Kempers to be kidnapped, but they were rescued by the commander of the American fort at Point Coupee. The Kempers pursued with great ferocity all who were engaged in this wrong upon them, and Reuben devoted himself to the task of driving the Spaniards from the American continent. He was engaged in an attempt to capture Mobile, which failed; and on the fitting out of the formidable expedition of Gutierrez and Toledo, in 1812, against the Spanish authority in Mexico, was assigned the rank of major, and afterward chosen colonel of the force, which co-operated with the Mexican insurgents. The expedition advanced into Texas, fought several bloody battles, in which Kemper and his Americans performed extraordinary feats of valor, and won brilliant victories. Kemper was subsequently engaged under General Jackson in the defense of New Orleans, and added greatly to his reputation as a soldier by his activity and efficiency. At the conclusion of the war he became a planter in Mississippi.

Kempff, Louis, American rear-admiral: b. Belleville, Ill., 11 Oct. 1841. He was graduated at the United States Naval Academy in 1861 and served with distinction throughout the Civil War. He was promoted captain in 1891, and became rear-admiral in 1899. When the Boxer troubles began in China in 1900 he was placed in command of the United States naval forces in Chinese waters. On 29 May he sent 108 marines ashore, who co-operated with the men landed from the other foreign warships in the harbor at Taku. When the Chinese forts were shortly after bombarded by the allied naval forces he declined to participate in the attack, on the ground that his government was not at war with China. For the judgment displayed on that occasion a joint resolution was pending in the 57th Congress conferring on him the thanks of Congress. He was retired from active service in October 1903.

Kem'pis, Thomas à, German devotional writer: b. Kempen, near Cologne, 1380; d. Mount Saint Agnes, near Zwolle, Netherlands, 26 July 1471. He was educated at Deventer by the Brethren of the Common Life, a religious order of men who passed a contemplative existence in transcribing manuscripts, compiling and writing religious books of various sorts, and religious exercises. In 1399 he entered the monastery of Mount St. Agnes, near Zwolle, of which his brother was prior, took the monastic vows in 1406, was ordained priest six years afterward, and in 1425 was elected sub-prior. He excelled as a copyist, and delighted to transcribe the Scriptures, the church fathers, and works of ascetic piety, while the fame of his eloquence and zeal was widely extended. He owes his present renown to his treatise ‘De Imitatione Christi,’ which has been translated into every language in Christendom. It has been wrongly but somewhat naturally attributed to the renowned theologian Gerson, chancellor of the University of Paris, and the question was debated with a view to national honor and the interests of ecclesiastical orders. The evidence in favor of the authorship of à Kempis is overwhelming. Three writers nearly his contemporaries mention him as author. Moreover several copies written in his own hand are extant, and in one ancient copy he is expressly named as the author. Both the literary style and the tone of refined piety which characterize this work are also distinguishing features of the devotional works of which he is certainly the author. Consult Kettlewell, ‘Thomas à Kempis and the Brothers of the Common Life’ (1884); Wolfsgruber, ‘Giovanni Gerson, sein Leben und sein Werk De Imitatione Christi’ (1880).

Ken, or **Kenn, Thomas,** English bishop and hymnologist: b. Little Berkhamstead, Hertfordshire, 1 July 1637; d. Longleat, Wiltshire, 19 March 1711. He was educated at Winchester School, graduated from New College, Oxford, and became successively domestic chaplain to Bishop Morley (1665); rector of Brightstone, Isle of Wight (1667); and prebend of Winchester (1669). He spent five years traveling on the continent with his nephew Izaak Walton, living principally at Rome (1675–80), and accompanied Mary, Princess of Orange, to Holland, as domestic chaplain. In 1680 he was appointed chaplain to Charles II., attended him in his last illness, and was nominated by him to the bishopric of Bath and Wells (1684). He suffered deprivation with other non-jurors (q.v.) on the accession of William of Orange, for maintaining allegiance to James II. (1691). He was one of the lights of the English Church in one of the darkest periods of English social life, and by his zeal and devotion did much to maintain the standard of Christian conduct, his personal example of goodness being backed by learning, taste, and breadth of sympathy. His theological and devotional writings are principally valuable for the personality with which they are connected, but his immortal 'Morning and Evening Hymns' have won for him imperishable fame as the guide and inspirer of Christian devotion. Consult: Plumptre, 'Life of Bishop Ken' (1888).

Kenai, kĕ-nī', a peninsula in the southern part of Alaska, with William Sound on the east, Gulf of Alaska east and south, and Cook Inlet on the west. It is about 160 miles long and 110 miles across the widest part. It has good harbors, valuable coal fields, and some gold has been discovered.

Ken'dal, Margaret Brunton Robertson (GRIMSTON), English actress: b. Great Grimsby 15 March 1849. She was a sister of T. W. Robertson, the dramatist (q.v.); was known on the stage as «MADGE ROBERTSON» and made her first appearance in London, as Ophelia, in 1865. She soon gained a reputation as an excellent actress of high comedy. On her marriage to W. H. Grimston (q.v.) in 1869 she assumed with him the stage name of Kendal. The Kendals made several visits to America after 1889 and secured favorable notice wherever they were seen.

Kendal, William Hunter (WILLIAM HUNTER GRIMSTON), English actor: b. London 16 Dec. 1843. After his marriage to Madge Robertson (see KENDAL, M. B. R.) in 1869, he played leading parts with her. He commenced his career on the stage at Glasgow in 1862, where he remained till 1866, supporting such stars as Mr. and Mrs. Charles Kean, Helen Faucit, G. O. Brooks, etc.; made his first appearance in London at the Haymarket Theatre in 1866, in 'A Dangerous Friend,' played there such parts as Charles Surface, Captain Absolute, Romeo, Orlando, Pygmalion, and in 1879–88 was lessee and manager with John Hare of the St. James Theatre, where were produced 'The Queen's Shilling'; 'The Squire'; 'Impulse'; 'The Ironmaster'; 'A Scrap of Paper'; 'Lady of Lyons'; and 'As You Like It.' He toured with Mrs. Kendal in the United States and Canada in 1889–95.

Ken'dall, Amos, American journalist and statesman: b. Dunstable, Mass., 16 Aug. 1789; d. Washington, D. C., 11 Nov. 1869. He was graduated from Dartmouth in 1811, studied law at Groton, Mass., in 1811–14, was admitted to the bar at Frankfort, Ky., in 1814, was postmaster and editor of the 'Patriot' at Georgetown, Ky., in 1815–6, and in 1816–29 co-editor and part owner of the 'Argus of Western America' at Frankfort. In 1829 he was appointed fourth auditor of the United States treasury, and during the Jackson administration he was extremely influential. He aided in the formation of the President's anti-bank policy (see JACKSON, ANDREW), was a special treasury agent to conduct negotiations with State banks, and is thought to have written several of Jackson's state papers. Appointed postmaster-general by Jackson in 1835, he was retained by Van Buren, but in 1840 resigned because of ill health. He cleared the post-office department of debt, and introduced numerous reforms. He established 'Kendall's Expositor,' bi-weekly, in 1841, and the 'Union Democrat,' weekly, in 1842, but both journals shortly ceased publication. In 1845 he became associated with S. F. B. Morse (q.v.) in the ownership and management of the Morse electric telegraph patents, and by his able direction ensured their commercial success and a fortune for himself. He gave largely in Washington for philanthropic purposes. Though calling himself a Jackson Democrat, he strongly opposed secession. He wrote an incomplete 'Life of Andrew Jackson, Private, Military, and Civil' (1843); 'Full Exposure of Dr. C. T. Jackson's Pretensions to the Invention of the Electro-magnetic Telegraph' (1867), and an 'Autobiography,' posthumously published (1872).

Kendall, George Wilkins, American journalist: b. Amherst (now Mount Vernon), N. H., 1809; d. Oak Springs, Texas, 22 Oct. 1867. Settling in New Orleans in 1835, he was one of the founders of the New Orleans *Picayune* in 1837, which became under his direction one of the leading journals of the South. He wrote 'Narrative of the Texas Santa Fe Expedition' (1844), an expedition in which he took part; and 'The War Between the United States and Mexico' (1851).

Kendall, Henry Clarence, Australian poet: b. Ulladalla district, New South Wales, 18 April 1841; d. Redfern, near Sydney, 1 Aug. 1882. He became a lawyer's clerk at Sydney in 1860, in 1863 a clerk in the lands department of the New South Wales public service; later was in the colonial secretary's office; in 1869–73 was active as a journalist at Melbourne; and for some time previous to his death was an inspector of forests. His chief volumes are: 'Leaves from an Australian Forest' (1869), and 'Songs from the Mountains' (1880). He has been called the «poet of the bush» because of his skilful delineation of the character of Australian landscape. In 1886 appeared a collected edition of his verse, with a memoir.

Kendall, William Sergeant, American painter: b. Spuyten Duyvil, N. Y., 20 Jan. 1869. He began as a member of the Art Students' League of New York, and subsequently was a pupil of Thomas Eakins of Philadelphia. He went to France and attended the Ecole des Beaux Arts, and also studied under Olivier Merson. He is equally successful in figure, portrait, and landscape, and has received several honors in acknowledgment of his merit as a fine colorist and powerful draftsman. One of his best pictures is 'The End of the Day,' in which tender sentiment is united with workmanship of excellence.

Ken'drick, Asahel Clark, American Baptist clergyman and scholar: b. Poultney, Vt., 7 Dec. 1809; d. Rochester, N. Y., 21 Oct. 1895. He was graduated from Hamilton College, Clinton, N. Y., in 1831, and was professor of Greek at Madison (now Colgate) University, Hamilton, N. Y., 1831–50; and held a similar post in the University of Rochester from 1850. Besides translations and several text-books, and revising and editing Olshausen's 'Old Testament Commentary' and Meyer's 'Commentary on John,' he published 'Our Poetical Favorites' (1880); 'The Moral Conflict of Humanity' (1894); etc. He was one of the American committee of New Testament revisers.

Kendrick, John, American navigator: b. Boston about 1745; d. Hawaii 1800. During the Revolution he sailed a privateer, and in 1787, while in command of the Columbia and the Washington, explored the northwestern coast of America and various Pacific islands. In 1791 he voyaged to the South Seas, and established the Chinese trade in sandalwood, which for a long time he successfully carried on. He was among the earliest American sailors to attempt voyages for discovery.

Kendrick, John Mills, American Protestant Episcopal bishop: b. Gambier, Ohio. He was educated in the university of his native town, and was ordained deacon 1864, and priest in the following year. After several years' experience as rector and missionary, in 1889 he was consecrated bishop of Arizona, a post he still occupies, with Phœnix, Arizona, as his see city.

Kenealy, kĕ-nēl'ĭ, **Arabella,** English novelist: b. Sussex. She is a daughter of Dr. Kenealy, the famous advocate of the Tichborne "Claimant," and after pursuing medical studies practised as a physician in London and at Watford 1886–94. She has published 'Dr. Janet of Harley Street' (1893); 'Such Men Are Such Gentlemen' (1894); 'Woman and the Shadow' (1898); 'A Semi-Detached Marriage' (1899); 'Charming Renée' (1900); etc.

Kenesaw (kĕn-ĕ-sâ') **Mountain,** a mountain in Georgia 25 miles northwest of Atlanta. It is famous as the scene of a battle in the Civil War between the Union troops under Sherman, and the Confederates under Johnston.

Kenesaw Mountain, Battle of. On the night of 18 June 1864 Gen. J. E. Johnston fell back before Gen. Sherman's persistent advance and took a new line with Kenesaw Mountain as its salient, his right wing thrown back so as to cover Marietta, and his left covering the railroad back to the Chattahoochee. Sherman worked to the right, threatening the railroad, and was attacked by Hood's corps at Kolb's Farm (q.v.), 22 June. After much study of the ground, Sherman concluded that he had no alternative but to assault Johnston's line or turn his position. Either course had its difficulties and dangers, but as the enemy and his own officers had settled down to the conviction that he would not assault fortified lines, but would execute flanking movements only, he considered that a successful assault would have a good moral effect and show that he could move against an enemy behind breastworks; so he resolved to attack the left centre of Johnston's position, and orders were given on the 24th that on the 27th McPherson should assault near Little Kenesaw and that Thomas should assault about a mile further south. Kenesaw was strongly intrenched and held by Loring's and Hardee's corps, Loring on the right, opposite McPherson, Hardee on the left, opposite Thomas. About 9 A.M. of the 27th the troops moved to the assault, and all along the lines for ten miles a furious fire of artillery and musketry was kept up. A part of Logan's Fifteenth corps, formed in two lines, fought its way up the slope of Little Kenesaw, carried the Confederate skirmish-pits, and tried to go further, but was checked by the rough nature of the ground and the fire of artillery and musketry delivered at short range from behind breastworks. Logan's assault failed, with a loss of 600 men, and his troops were withdrawn to the captured skirmish-pits. About a mile to the right Thomas assaulted with Newton's and Davis' divisions. The troops charged up the face of the mountain, drove in the skirmish-line, and reached the main works, but were unable to carry them under the heavy fire of canister and musketry at short range; after heroic effort and the loss of Gens. C. G. Harker and Daniel McCook, commanding brigades, and 1,580 killed, wounded, and missing, fell back and intrenched 75 yards from the enemy's works. The assault was over by 11.30 A.M., and was a failure. It was the most serious reverse sustained by Sherman in the campaign. The entire Union loss was nearly 2,500; Johnston admits a Confederate loss of 808 killed and wounded. Consult: 'Official Records,' Vol. XXXVIII.; Cox, 'Atlanta'; Van Horne, 'History of the Army of the Cumberland,' Vol. II.; Sherman, 'Personal Memoirs,' Vol. II.; Johnston, 'Narrative'; The Century Company's 'Battles and Leaders of the Civil War,' Vol. IV.

E. A. Carman.

Kenia, kā'nẹ-ā, **Mount,** an isolated extinct volcano situated in British East Africa, a few miles south of the equator. Its summit is covered with perpetual snow, and for this reason it is known as Doenyo Ebor or White Mountain. Its height is from 18,000 to 19,000 feet. It was discovered by Krapf in 1849, and its summit was first reached (by Kolb) in 1895.

Kenilworth, kĕn'l-wĕrth, a novel by Sir Walter Scott, published in 1819, when its author had long been distinguished both as poet and novelist. It was the second of his great romances drawn from English history; the central figure is that of Queen Elizabeth, surrounded by the brilliant and famous characters of the period — Burleigh, Edmund Spenser, Sir Walter Raleigh; and also by a host of petty sycophants.

Ken'ly, John Reese, American soldier: b. Baltimore 1822. He served in the American army during the Mexican War, attaining the rank of major, and during the Civil War commanded the 1st Maryland regiment, which was captured by Stonewall Jackson at the battle of Front Royal, 23 May 1862. He subsequently commanded a brigade and was brevetted major-general of volunteers at the close of the War. His experiences during the Mexican War are recounted in his 'Memoirs of a Maryland Volunteer' (1873).

Ken'nan, George, American traveler, author, and lecturer: b. Norwalk, Ohio, 16 Feb. 1845. He received a secondary education, became a telegraph operator, in 1865 went to northeastern Siberia as an explorer and telegraph engineer, and in 1866–8 superintended the construction of the middle division of the Russo-American telegraph line. In 1870–1 he explored the mountain region of eastern Caucasus and Daghestan, upon his return to America was active as lecturer and journalist, and in 1877–85 was night manager of the Associated Press at Washington, D. C. In 1885–6, with G. A. Frost, an artist, he accomplished a journey of 15,000 miles through Russia and Siberia in investigation of the Russian exile system. He visited all the mines and prisons between the Ural Mountains and the headwaters of the Amur, and published an account of his observations in ‹Siberia and the Exile System› (1891), first printed in the ‹Century Magazine› (1889–90). From 1886 he lectured in Great Britain and the United States on his Siberian experiences. In 1898, during the Spanish-American war, he visited Cuba with the Red Cross Society and as special commissioner of the ‹Outlook› of New York, to which he contributed valuable articles. In 1902 in company with American scientists he explored Mt. Pelée, Martinique, and the scene of the St. Pierre disaster. He further published in book form: ‹Tent Life in Siberia› (1870), and ‹Campaigning in Cuba› (1890).

Kennebec (kĕn-ẹ-bĕk') **River,** a river in Maine, next to the Penobscot the most important in the State. Its principal source is Moosehead Lake, on the boundary line between Somerset and Piscataquia counties. After a course of 20 miles it receives Dead River from the right. It enters the Atlantic in Sagadahoc County through Sheepscott Bay, an irregular indentation of the coast studded with many islands. The largest tributary of the Kennebec is the Androscoggin, which joins it 18 miles from the ocean at Merrymeeting Bay. The outlets of a number of small ponds, and Sebasticook and Sandy rivers, also flow into it. The most important towns on its banks are Bath, Richmond, Gardiner, Hallowell, Augusta, and Waterville. It has falls at Waterville and at three points above, which afford excellent motive power. Its whole length is about 150 miles, in which it has a descent of 1,000 feet. The influence of the tide extends to Augusta, 42 miles from the sea. A dam with locks was constructed at Augusta for the purpose of improving the navigation above that point, and increasing the water power. The structure is 584 feet long and 15 feet above ordinary high water mark, and cost $300,000. It forms a pond 16½ miles in extent, with an average depth of 16 feet. The river is closed by ice at Hallowell from the middle of December to about 1 April; below Bath it is open at all seasons except during winters of unusual severity.

Kennebunk, kĕn-ẹ-bŭnk', Maine, town in York County, on the Kennebunk and Mousan rivers and the Boston & Maine railroad, 24 miles southwest of Portland. The ample water-power here is utilized for various manufacturing industries, among the articles produced being leatheroid, sample-cases, shoe-stiffenings, fibre-board, and lumber. The town has a free circulating library containing several thousand volumes. It is one of the old towns of Maine, its settlement dating from about 1650. Until 1820, the year in which Maine became a separate State, Kennebunk was a part of Wells. Pop. (1890), 3,172; (1900), 3,228.

Kennebunkport', Maine, town in York County, 25 miles southwest of Portland, on the Atlantic Ocean, at the mouth of the Kennebunk River, and on the Boston & Maine railroad. It is situated on a good harbor, has an excellent beach, fine boating facilities on the river, and is a favorite summer resort with superior hotel and boarding-house accommodations. Besides Talbot's Library, the town has public and circulating libraries. Its industries include the manufacture of lumber and the building of boats and canoes. The town was settled in 1629, and incorporated as Cape Porpoise in 1653. Having been nearly destroyed by Indians in 1703, it was reincorporated in 1717 as Arundel, and in 1821 took its present name. Pop. (1890), 2,196; (1900), 2,123.

Ken'nedy, John Pendleton, American novelist: b. Baltimore, Md., 25 Oct. 1795; d. Newport, R. I., 18 Aug. 1870. He was graduated at Baltimore College in 1812, and in 1814 served as a volunteer in the ranks, taking part in the battles of Bladensburg and North Point. In 1816 he was admitted to the practice of the law, which he followed successfully for 20 years. In 1818 he commenced authorship, by the publication, in connection with his friend Peter Hoffman Cruse, of the ‹Red Book,› a serial of light character in prose and verse issued about once a fortnight, and continuing two years. In 1820 he was elected to the Maryland house of delegates, and re-chosen the two next years. In 1832 he published his first novel, ‹Swallow Barn, or a Sojourn in the Old Dominion,› descriptive of the plantation life of Virginia. In 1835 appeared ‹Horseshoe Robinson, a Tale of the Tory Ascendency,› the most successful of his writings. In 1838 he published ‹Rob of the Bowl, a Legend of St. Inigoes,› relating to the Maryland province in the days of Cecilius Calvert, second Lord Baltimore. Kennedy was a member of Congress 1839–45, and was prominent among the Whig members. In 1849 appeared his ‹Life of William Wirt, Attorney-General of the United States,› and in 1852 he became secretary of the navy. His works not previously named include: ‹Annals of Quodlibet› (1840); ‹Mr. Ambrose's Letters on the Rebellion› (1865). He was a friend of Thackeray, and wrote or sketched in outline the fourth chapter of the second volume of ‹The Virginians.› Consult ‹Life› by Tuckerman.

Ken'net River, a tributary of the Thames, in England. It rises in Wiltshire, flowing east through Berkshire, emptying into the Thames at Reading, after a course of 46 miles. It is a part of the waterway connecting the North Sea with Saint George's Channel.

Kenney, kĕn'ĭ, **Richard Rolland,** American politician: b. Little Creek Hundred, Sussex County, Del., 9 Sept. 1856. He was graduated was State librarian, 1879–83. In January 1887, was admitted to the Delaware bar in 1881, and was State librarian, 1879–83. In January, 1887, he was elected to the United States Senate as a Democrat and became a popular leader. His term expired in March 1901, and a deadlock occurring in the Delaware legislature, which was Republican, a successor to Kenney was not elected and Delaware is now (1903) unrepresented in the National Senate.

Ken'ny, Sir Edward, Canadian statesman: b. County Kerry, Ireland, 1800; d. Halifax, N. S., 16 May 1891. He removed to Halifax in 1824, where he engaged in business, and was mayor at one time. He was member for 26 years of the legislative council of Nova Scotia, during 11 of which he was president; served as receiver-general of Canada 1869–79; president of the privy council 1869–70; and senator 1867–70; being knighted in the year last named.

Kenosha, kĕ-nō'sha̤, Wis., city, county-seat of Kenosha County; on Lake Michigan, and on the Chicago & N. railroad; about 35 miles south of Milwaukee. It has steamer communication with many of the ports on the Great Lakes. It is a trade centre for quite an extent of country. Its chief manufactures are leather, typewriters, furniture, wagons, lamps, machinery, iron bedsteads, and flour. It is the seat of Kemper Hall School (P. E.). The Simmons Memorial Library contains about 6,000 volumes. The city owns and operates the waterworks; the water is obtained from the lake and artesian wells. Pop. (1890) 6,532; (1900), 11,606.

Ken'rick, Francis Patrick, American Roman Catholic bishop: b. Dublin, Ireland, 3 Dec. 1797; d. Baltimore 6 July 1863. After studying in Rome 1815–21, he was ordained priest in the latter year and sent to this country to take charge of a seminary at Bardstown, Ky. He remained at Bardstown nine years till his appointment as coadjutor bishop of Philadelphia in 1830. Twelve years later he became bishop of Philadelphia and there founded the seminary of St. Charles Borromeo. In 1851 he was installed archbishop of Baltimore and the next year presided over the first plenary council of American Roman Catholic prelates. He became honorary primate of the United States in 1859. He was prominent as a controversalist and a Biblical scholar, and published ‘Dogmatic Theology’ (1839–40); ‘Moral Theology’ (1841–3); a revision of the Douai English Bible, with notes, etc.

Kenrick, Peter Richard, American Roman Catholic archbishop: b. Dublin, Ireland, 17 Aug. 1806; d. St. Louis, Mo., 4 March 1896. After studying at Maynooth he was ordained priest in 1830, and came to the United States in 1833. He was professor of dogmatics in the seminary of the diocese of Philadelphia and subsequently became vicar-general. In 1841 he was appointed coadjutor to Bishop Rosati, of St. Louis, succeeded to that bishopric in 1843, and was created first archbishop of St. Louis in 1847. He opposed the dogma of papal infallibility but acquiesced in its final decree. He published ‘The Holy House of Loretto’; ‘Anglican Ordinations’; ‘Vaticana’; etc. Consult O'Shea, ‘The Two Archbishops Kenrick’ (1904).

Kenrick, William, English miscellaneous writer: b. about 1725; d. London 10 June 1779. He believed himself a genius, and was for years active as a libeler of successful authors and actors. Among those whom he attacked were Goldsmith, Garrick, Johnson, Colman, and Fielding. He lectured, too, on subjects ranging «from Shakespeare to the perpetual motion, which he thought he had discovered.»

Kenrick, William, American nurseryman: b. 1795; d. 1872. He was the son of a nurseryman, whose gardens occupied the locality where John Eliot first preached to the Indians, and at 28 he became a partner with his father. He is remembered as having introduced into America the culture of the mulberry tree in order to establish a native silk industry, his book, ‘The American Silk Growers' Guide,’ in reality a work on mulberry culture, being issued in 1835. Among other novelties he introduced into America was the Lombardy poplar.

Ken'sett, John Frederick, American painter: b. Cheshire, Conn., 22 March 1818; d. New York 14 Dec. 1872. His uncle, Alfred Daggett, an engraver, gave him his first lessons in art, but in 1840 he went abroad and for seven years traveled in England, Switzerland and Italy. The fruit of this student-ramble was a large number of sketches and paintings, out of which he exhibited in 1845 in the Royal Academy. On returning to America he lived chiefly in New York and in 1849 was elected a National academician. His landscapes are more remarkable for sweetness than for strength, but he maintains a uniform standard of merit in all of them. His technique is delicate and refined, especially in his small canvases. He delights in the scenery of the Hudson, and of the seacoast, and some of his effects are exquisitely charming. Among his landscapes the most interesting are ‘Sunset on the Coast’ (1858); ‘October Afternoon’ (1864); ‘Noon on the Sea-Shore,’ which has been engraved by Hunt. Several of his pictures are in the Metropolitan Museum of Art, New York, the finest of them being ‘White Mountains,’ a masterpiece of its class. He was for some years a member of the national art commission appointed to direct the decoration of the National Capitol.

Ken'sington Gardens, a celebrated public park in London four miles west of Saint Paul's, and well known for its royal palace. In former times Kensington Palace was a favorite royal residence; and King William III., Queen Mary, Queen Anne, and George II. died here. Kensington Gardens and Hyde Park are much frequented in summer, and form a great ornament to the metropolis. They cover about 350 acres, and contain the Albert Memorial. In South Kensington the chief attractions are the South Kensington or Victoria and Albert Museum, the Indian Museum, the Natural History Museum, and the Imperial Institute.

Kensington Palace. See Kensington Gardens.

Kensit, John, English anti-ritualist: b. London about 1852; d. Liverpool 8 Oct. 1902. He kept a small bookshop in Paternoster Row, London, but in 1896 began an attack upon the Roman Catholic Church and the ritualistic party in the Church of England. He organized bands of preachers, called Wicliffites, that disturbed public worship and frequently caused riots. At the public ceremony of the confirmation of Canon Gore as bishop of Worcester (22 Jan. 1902) he objected, and then and at the subsequent consecration disturbances occurred. Since his death the movement has had no prominence.

Kent, Charles Foster, American Biblical scholar: b. Palmyra, N. Y., 13 Aug. 1867. He was graduated at the universities of Yale (1889) and Berlin (1892), and the following year became an instructor in the University of Chicago.

In 1895 he was elected professor of Biblical literature and history at Brown University, a position which he held until 1901. He is at present Woolsey professor of Biblical literature at Yale University. Among his writings are: 'Outlines of Hebrew History' (1895); 'The Wise Men of Ancient Israel and Their Proverbs' (1895); 'History of the Hebrew People, the United Kingdom' (1896); 'History of the Hebrew People, the Divided Kingdom' (1899); 'Messages of the Earlier Prophets' (1899); 'Messages of the Later Prophets' (1900).

Kent, Jacob Ford, American general. b: Philadelphia, Pa., 14 Sept. 1835. He entered the army as 2d lieutenant 6 May 1861, became captain in January 1864; and was brevetted colonel of volunteers in October 1864, for faithful and meritorious services in the field during the campaign before Richmond. At the opening of the war with Spain he was colonel of the 24th infantry. He was made major-general of volunteers 8 July 1898, and served with distinction in Cuba, and afterward in the Philippines. He was retired in October 1898.

Kent, James, American jurist: b. Philippi, Putnam County, N. Y., 31 July 1763; d. New York 12 Dec. 1847. Kent was graduated at Yale College in 1781, studied law, was admitted in 1785 as an attorney, and in 1787 as a counsellor, and commenced the practice of his profession in Poughkeepsie. He soon became remarkable among his contemporaries for his legal learning and literary attainments. He was elected successively in 1790 and 1792 a member of the legislature for Dutchess County. Kent became an active and leading Federalist, attracting the notice and confidence of Hamilton and Jay. It was by Hamilton's counsel that the reading of the young lawyer was directed to the doctrines of the civil law, and the treatises of the jurists of continental Europe. In 1793 Kent removed to New York, was appointed one of the two masters in chancery for the city of New York. In 1796 he became a member of the legislature. He was also elected professor of law in Columbia College. The body of his lectures at Columbia formed in after years, in some degree, the basis of his celebrated 'Commentaries.' In 1797 he was appointed recorder of the city, and in 1798 judge of the supreme court. He continued a member of this tribunal till 1814, having been from 1804 chief justice. The supreme court at that time differed widely from the court as at present constituted. It was formed after the model of the English king's bench, being composed of five judges, who rode the circuits to try jury cases, and convened during the year at four appointed terms to decide reserved questions of law. There were no American law books, and no reports of American decisions, except those of Dallas, just commenced. The proceedings of the court were languid and dilatory; and resort was had for rules of procedure and principles of law almost exclusively to English precedents and decisions. The accession to the bench of a young, energetic, and able judge, produced a striking change. It was the task of the court to expound the principles of the common law, as applicable to American institutions; to define and limit our new constitutional provisions; to construe recent statutes; to bring the principles of commercial law to bear upon transactions of trade and commerce; to devise rules of practice; and in short to adapt to a young and rising nation a complicated yet practical code of laws. By the constitution of New York as it then existed an important political duty was imposed on the judiciary of the State. The judges of the supreme court and the chancellor formed with the governor a council of revision with a qualified veto on legislative acts. This council was abolished in 1822. In 1814 Kent became chancellor and the seven volumes of Johnson's 'Chancery Reports,' which contain Chancellor Kent's decisions, afford a profound exposition of the system of equity law. His term of office as chancellor expired in 1823, and returning to New York he resumed his professorship at Columbia and his lectures there were given to the world, in his 'Commentaries on American Law' (1826-30). This work has since passed through 14 editions, and acquired a world-wide celebrity. It has assumed in the United States the position which Blackstone in his own country has long filled by his 'Commentaries on the Laws of England.' It embraces not merely the jurisprudence of the Federal Union, but the municipal law, written and unwritten, of the several States. Consult William Kent, 'Memoirs and Letters of Chancellor Kent' (1898).

Kent, William, English artist, architect and landscape gardener: b. Yorkshire 1684; d. London 12 April 1748. He was apprenticed to a coachmaker in 1698, went to London in 1703, and there made some attempts at painting, and to Rome, where he was a pupil of the Cavalier Luti, and whence he was brought to England by the Earl of Burlington, his patron for the rest of his life. He was employed in portrait-painting and the decoration of walls and ceilings; but Hogarth said that «neither England nor Italy ever produced a more contemptible dauber.» However, he did invent a less formal method of gardening and planting, and excelled as an architect. The Horse Guards and treasury buildings, and Devonshire House, Piccadilly, are his work. He published the 'Designs of Inigo Jones' (1727).

Kent Island, the largest island in Chesapeake Bay, Md., some 15 miles long, and situated 7 miles east of Annapolis. It was here the first settlement in Maryland was made by William Claiborne (q.v.) in 1631. Pop. (1900) 2,525.

Ken'ton, Simon, American pioneer: b. Fauquier County, Va., 3 April 1755; d. Logan County, Ohio, in 1836. At 16 he had an affray with a young man, and believing he had killed his adversary, fled beyond the Alleghanies and became a companion of Boone and the other early pioneers of Kentucky. For a time he acted as a spy of Governor Dunmore, and subsequently participated in the warfare waged against the British and the Indians west of the Alleghanies, showing remarkable courage, sagacity, and endurance. In 1782, learning that his former opponent was living, he returned to his native place, and soon after removed with his father's family to Kentucky. He was frequently engaged in Indian warfare, until the expedition under Wayne in 1793-4 restored tranquillity to the western frontier. As the country began to fill up with settlers, his lands, to which, in consequence of his ignorance of or indifference to legal forms, he had never secured perfect titles, were taken from him, and by repeated lawsuits he was reduced to penury. He nevertheless in the War of 1812 fought with the Kentucky troops at the battle of the Thames. In 1824 he appeared in Frankfort in tattered garments to petition the legislature of Kentucky to release the claim of the State upon some mountain land owned by him. His appearance at first excited ridicule, but upon being recognized he was treated with much distinction by the legislature; his lands were released, and a pension of $240 was procured for him from Congress. He died near the spot where, 58 years previous, he had narrowly escaped death at the hands of the Indians.

Kenton, Ohio, city, county-seat of Hardin County; on the Scioto River, and on the Erie, the Toledo & O. C., and the Cleveland, C., C. & St. L. R.R.'s; about 54 miles northwest of Columbus and 67 miles south of Toledo. It is situated on the divide which separates the waters of the Ohio River from those of Lake Erie. It was settled in 1833 and incorporated in 1885. The surrounding country is a farming section, with some large forests. The chief manufactures of the city are hardware, agricultural implements, iron, lumber, and dairy products. Its principal public buildings are the armory, jail, court-house, and the municipal buildings. The mayor holds office two years. The waterworks plant is owned by the city. Pop. (1900) 6,852.

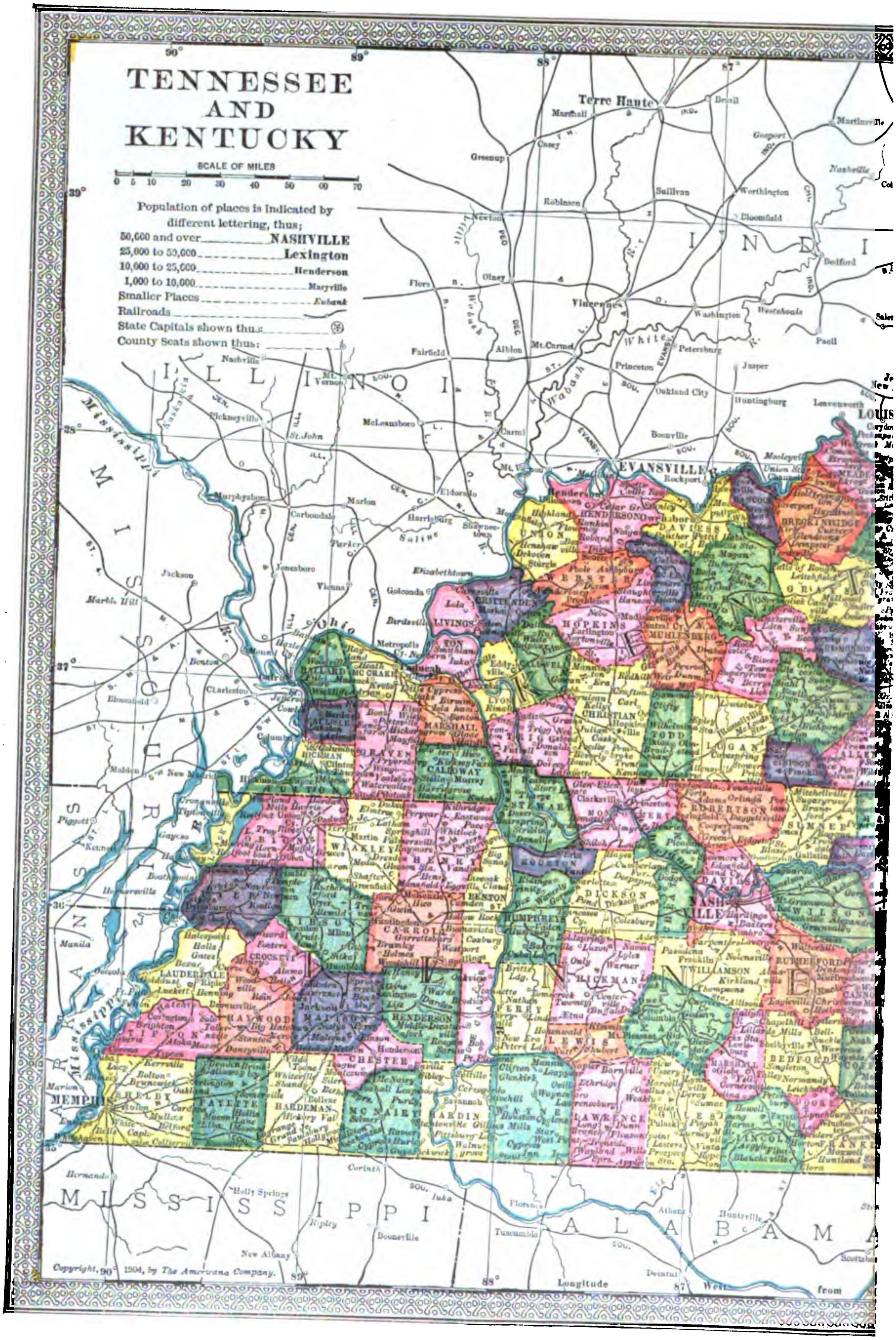
Kentucky (Cherokee, «prairie,» «the Barrens,» and not meaning «dark and bloody ground,» as popularly supposed), one of the old «Border States» (q.v.), next south of the Ohio; the second district settled beyond the Alleghanies, and the first to become a State; second State admitted to the Union, next after Vermont. Capital, Frankfort. It is excessively irregular in shape, varying from 171 miles broad between Cincinnati and Cumberland Gap to 40 south of Paducah at the mouth of the Tennessee; and is 458 miles from east to west. Area 40,400 square miles. Lat. 36° 30′ to 39° 6′ N.; lon. 82° 2′ to 89° 40′ W. Pop. (1900) 2,147,174; (1903) government estimate about 2,250,000.

Topography and Hydrography.—Its northern and western boundaries are formed by the convolutions of the Ohio and Mississippi separating it successively from Ohio, Indiana, Illinois, and Missouri; the east end is a sharp angle, the north side formed by the Big Sandy flowing northwest, the south side against West Virginia by the main Cumberland range and Pine Mountain running northeast and southwest. On the south it is separated its entire length from Tennessee by a nearly straight boundary with a «jog» at the Tennessee. The surface is mainly a plateau averaging about 800 feet above sea-level, sloping in general northwestwardly from the southeastern mountains to the Ohio. Parallel with the Cumberland range within the State is Pine Mountain, along whose eastern flank the Cumberland River flows, breaking through at a point 960 feet above the sea. The Cumberland valley between is 15 miles wide by 75 long, and from 1,000 to 1,500 feet in elevation, buttressed by peaks sometimes 3,500 feet high, while the two ranges are 2,000 to 3,000, making the valley the finest scenic portion of the Appalachian system. Pine Mountain throws out spurs to the northwest as high as the main range, which sinks into the coal fields at an elevation of nearly 1,600 feet. The great north and central Blue Grass region (limestone) is an undulating plateau, circled by a continuous hill-ridge taking many different local names, as Big Hill, King's Mountain, Muldrow's Hill, and others, but extending in a great southern sweep from the mouth of Salt River to opposite the mouth of the Scioto, with rough escarpments at the east and fading into the upland at the west.

The drainage system is mainly (except for the immediate watersheds of the great rivers) by a series of rivers flowing northwestward into the Ohio, following the surface trend; the Big Sandy with its Louisa fork, the Licking, Kentucky, Salt and Green. Near the western end the last 60 or 70 miles of the widely eccentric course of the Cumberland and Tennessee, its greatest internal rivers, follow the same direction to the same goal 15 miles apart. The Cumberland, rising near the eastern edge, flows crookedly through the southern part, dips into Tennessee, and returns to the State; the Tennessee, rising near it in the Appalachians, takes a wider sweep southward into Alabama, and almost joins the Cumberland before it ends. These streams have nearly all deep rock channels, never overflowed; especially the Kentucky in its lower course has channeled a superb gorge through over 400 feet of limestones, with perpendicular walls like a cañon. Southwest from the centre only the larger stream channels show on the surface; the ground is full of depressions where the water sinks away and dissolves the soft limestones, finding subterranean paths; where this underground channel is stopped up a pond is formed. This is the district of the Mammoth Cave (q.v.), the largest in the world; as in all limestone districts, the waters have dissolved the stones irregularly and left fantastic channels and rock sculptures, huge chambers and narrow flumes, forming deep pools and cascades, and creating pendants and upright shafts; its immense size and length, and the navigable branches of a considerable subterranean stream, make it convenient for exploration and a fascinating spot for tourists.

Geology and Mineralogy.—This district was at one time the bed of a vast lake of the Lower Silurian period; on its floor were laid several sedimentary deposits. Upper Silurian, Devonian, Subcarboniferous, some 5,000 feet deep, and on these, Carboniferous (coal measures) to 3,000 feet more. The great Appalachian uplift raised this some 5,000 feet, the surface forming a dome in the centre; then forces of denudation acted planewise across the top, cutting away all the superincumbent strata down to the original Lower Silurian in the middle — whence the outcrop of blue limestone in the Blue Grass region — and others to different extents in other parts, leaving the coal measures exposed in two great patches 100 miles apart at the edges. The Subcarboniferous limestone is at the top in the southwest districts where are the great sinks and caves.

The great mineral product of Kentucky is coal. The eastern (Appalachian) field has some 9,000 square miles; the western but 4,000; but the latter at present yields more than the former. In 1902 the total production was 6,421,266 short tons against 2,972,640 in 1892, nearly all bituminous, though perhaps 100,000 tons were



TENNESSEE AND KENTUCKY

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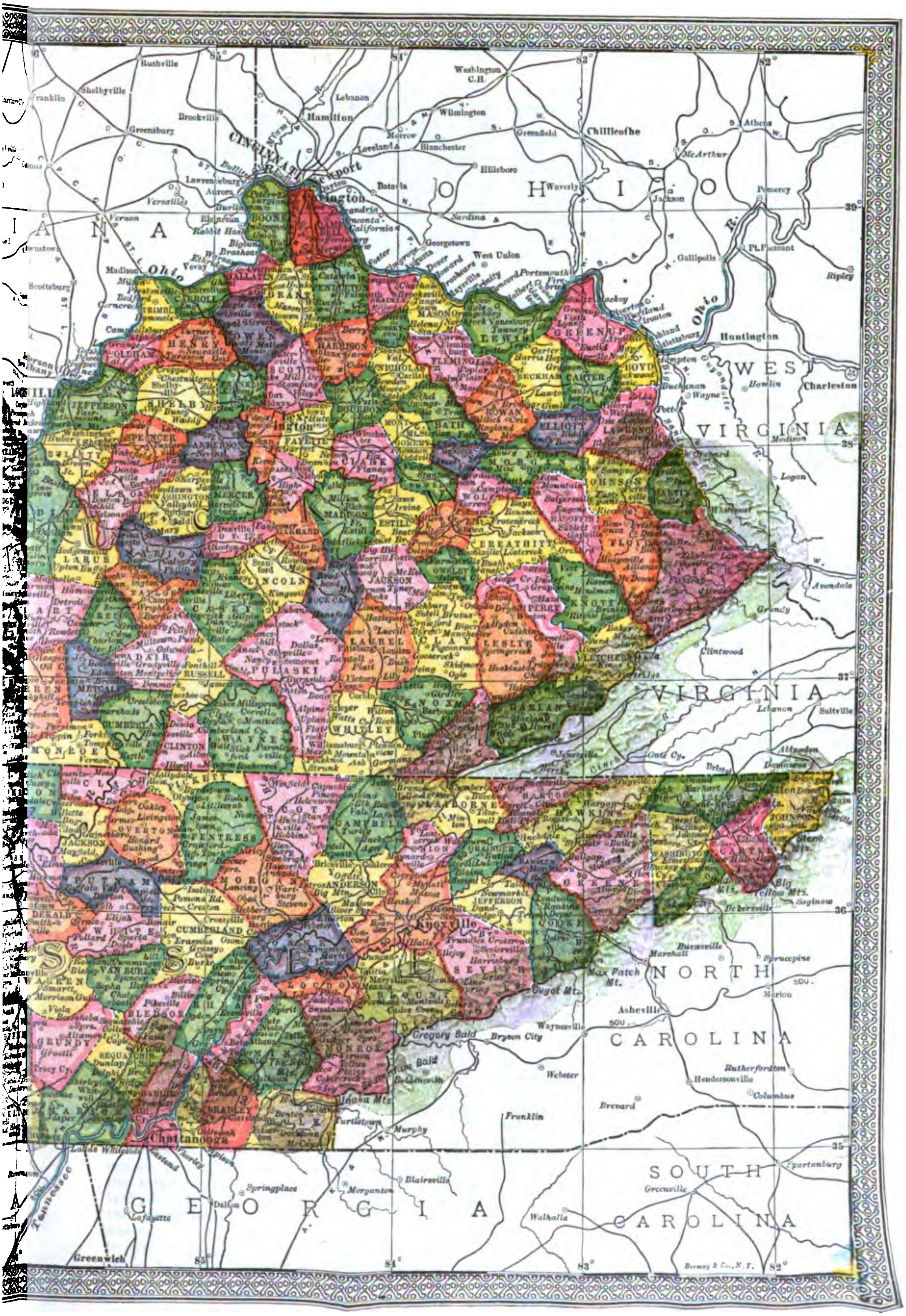
O H I O
W E S T
V I R G I N I A
VIRGINIA
N O R T H
C A R O L I N A
S O U T H
C A R O L I N A
G E O R G I A
I N D I A N A
Cincinnati
Hamilton
Lebanon
Washington C.H.
Wilmington
Chillicothe
Greenfield
Hillsboro
Batavia
Georgetown
West Union
Portsmouth
Waverly
Jackson
McArthur
Athens
Pomeroy
Gallipolis
Pt. Pleasant
Ripley
Huntington
Charleston
Hamlin
Wayne
Logan
Madison
Rushville
Shelbyville
Franklin
Greensburg
Brookville
Lawrenceburg
Aurora
Vernon
Versailles
Madison
Scottsburg
Ohio R.
Lexington
Knoxville
Chattanooga
Asheville
Waynesville
Bryson City
Webster
Brevard
Hendersonville
Rutherfordton
Columbus
Marion
Burnsville
Spruce pine
Marshall
Max Patch Mt.
Guyot Mt.
Gregory Bald
Franklin
Murphy
Blairsville
Morganton
Springplace
Dalton
Lafayette
Greenwich
Walhalla
Greenville
Spartanburg
Lebanon
Saltville
Abingdon
Bristol
Clintwood
Grundy
Avondale
Tennessee R.
Clinch R.
BOONE
KENTON
CAMPBELL
GALLATIN
GRANT
PENDLETON
BRACKEN
MASON
LEWIS
GREENUP
BOYD
CARTER
ELLIOTT
LAWRENCE
JOHNSON
MARTIN
PIKE
FLOYD
KNOTT
PERRY
LESLIE
CLAY
LAUREL
KNOX
WHITLEY
BELL
HARLAN
LETCHER
BREATHITT
MAGOFFIN
MORGAN
ROWAN
FLEMING
NICHOLAS
HARRISON
BOURBON
BATH
MONTGOMERY
CLARK
MADISON
ESTILL
JACKSON
OWSLEY
LEE
WOLFE
POWELL
MENIFEE
FAYETTE
SCOTT
OWEN
CARROLL
TRIMBLE
HENRY
OLDHAM
SHELBY
JEFFERSON
SPENCER
ANDERSON
MERCER
BOYLE
GARRARD
LINCOLN
ROCKCASTLE
PULASKI
CASEY
ADAIR
RUSSELL
WAYNE
CLINTON
CUMBERLAND
METCALFE
MONROE
TAYLOR
LARUE
MARION
WASHINGTON
NELSON
BULLITT
GREEN
HART
CLAY
PICKETT
FENTRESS
SCOTT
CAMPBELL
CLAIBORNE
HANCOCK
HAWKINS
SULLIVAN
JOHNSON
CARTER
WASHINGTON
UNICOI
GREENE
COCKE
SEVIER
JEFFERSON
GRAINGER
UNION
KNOX
ANDERSON
MORGAN
OVERTON
JACKSON
PUTNAM
WHITE
CUMBERLAND
ROANE
LOUDON
BLOUNT
MONROE
McMINN
MEIGS
RHEA
BLEDSOE
VAN BUREN
WARREN
GRUNDY
SEQUATCHIE
MARION
HAMILTON
BRADLEY
POLK
DE KALB
39°
38°
37°
36°
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cannel. Beds of high-grade iron ore are also found in the coal fields, and elsewhere to the extent of 32 counties in all; 71,562 tons of pig iron were turned out in 1900. Building and other stones are extensively quarried: limestone products (including Kentucky River marble), as well for fertilizers and charged waters as for building, were valued at $176,861 in 1900; sandstones, $130,557, besides $20,191 worth of clays. Extensive mining of fluor-spar is carried on in Crittenden and Livingston counties; valuable salt and other mineral springs are utilized; petroleum is found in the counties along the Cumberland and its affluents, formerly distilled from shales and now drilled for, its discovery in several counties in 1902 having caused considerable excitement. Its accompaniment, natural gas, is found in Meade County.

Climate and Rainfall.—The Mississippi bottom lowlands are malarious, but most of the State is mild and notably salubrious, the death rate being low and the army statistics placing Kentuckians at the very top in physical characteristics. The lowest recently recorded temperature is 8° F., and the summer heats are less than in the States to the north and west. The State is ideally watered for agriculture, the mean rainfall is about 47 inches per year, and there are no years of excessive drought.

Forests.—Over a third of the surface of the State is forested. The bottom lands are thick with densely timbered swamps; the western part is a heavily wooded region once open prairie («the Barrens,» where the Indians burnt off the undergrowth to make pasturage for the wild game, and the more tenacious roots grew under the soil); and in the east along the Alleghany slopes there is a great quantity of fine timber, most of it being hardwood of astonishing variety. Oaks of many different sorts — white, red, black, post, overcup, chestnut, and black-jack,— hickory, black walnut, blue and black ash, maple, elm, beech, chestnut, poplar, sweet gum, box-elder, wild cherry, yellow pine, cypress, sycamore, and hackberry, are only a portion of its wealth, still largely virgin, though now being rapidly opened up. The poplar and black walnut which are accessible have been already largely harvested.

Soil.—The soils are locally divided into three main grades — first, second, and third rate. The first is the deep alluvium of the river bottoms, estimated at 1,000 square miles. The second (such only by comparison with the first, being one of the finest farming soils known) is the upland Blue Grass soil, covering over 10,000 square miles in 32 counties self fertilized by the decomposition of limestones and phosphatic shales so that farms a century old show no signs of exhaustion, and with decent management need no artificial fertilizer. The third are the shaly lands with insufficient drainage. Besides these there are about 1,500 square miles in swamps and barrens and some thousands where the mineral wealth is worth more than the surface would be for farming land.

Agriculture.—Though Kentucky and Tennessee are apparently artificial divisions from the same body of land, the slight difference in latitude and soils works a complete change in the characteristic products of the two. Tennessee is preeminently a cotton State, raising in 1899 234,592 bales, valued at over $8,000,000; while Kentucky raised but 1,369 bales, in a few counties near the Mississippi bottoms. But the immense fertility and water supply of Kentucky have made it one of our leading agricultural States; the value of its crops in 1899 was $123,266,785, and its live stock was valued at $73,737,106. The leading farm products are corn, tobacco, wheat and hay; and it raises nearly all the hemp produced in the United States. Vegetable and orchard fruits are grown in large quantities in the region along the Ohio, between and near the two great cities of Cincinnati (with its Kentucky suburbs Covington and Newport) and Louisville, which furnish large markets. In 1900 85.9 per cent of the land surface was in farms, and of this 62.5 per cent was improved against 35.2 per cent in 1850. The number of farms had more than trebled in the meantime, it had increased 30.9 per cent. since 1890. The average size of farms decreased in the decade, under intensive cultivation, from 119.4 acres to 93.7; the size being smallest in the northeast, the region of tobacco and corn, and largest in the stock-raising counties, but in most counties the size keeps near the average. The difference in proportion of colored population from the States where cotton is a leading crop is strikingly shown by the statistics of farm ownership and tenure. Out of 234,667 farms only 11,238 were operated by colored farmers; and as their farms averaged only 39.9 acres, they farmed only two per cent. of the land. The most conspicuous change in the decade was that of tenure, the number of cash tenants remained about the same, that of share tenants doubled. But the owned farms were over two thirds of the whole.

The great specialty of Kentucky, and its principal sale crop (most of the cereals being used in the State), is tobacco. In 1900 it not only produced two and a half times the amount of any other State,— 314,288,050 pounds, valued at $18,541,982, against 127,000,000 and 122,000,000 for North Carolina and Virginia respectively,— but 36 per cent of the entire product of the United States. This was an increase of 41.6 per cent. over 1890, and the largest crop ever reported. The yield averaged 816.7 pounds per acre, and the price 5.9 cents per pound. The preeminence of Kentucky in this is due not only to the favorable constituents of the soil for the plant's growth, but to the sunny equable climate, free from those violent extremes which are death to the delicate plant. The leading section is the west: Christian and Daviess counties head the list. Hemp is a famous product as being almost peculiar to Kentucky; but other fibres have driven it out of the market very largely, and it is of minor practical importance, having steadily declined since 1859. In that year it reached its climax, 78,818,000 pounds; in 1899 it was only 10,303,560, valued at $468,454, a decrease of about 86.93 per cent since 1859; and was grown by 937 farmers in 17 counties, the chief being Fayette (Lexington), and the rest mainly to the south of it. The largest crop in value was corn, which has long been the great staple, not only for human food, but even more for provender and as a basis of the great distillery interest. Its acreage in 1900 was over half the total for all crops together, and more than double that for the next largest, wheat, and the crop was valued at nearly $30,000,000. Wheat, for a long time dropping off, gained nearly 60 per cent. in the decade, with a total of 14,264,500 bushels, valued at $8,923,760. Hay and forage from grasses of several different kinds on the superb pasture of the State, came next, with a total of 776,534 tons, valued at $6,100,647; grass seed also had considerable importance. Oats and potatoes each came to the total of nearly a million and a quarter dollars; orchard fruits, nearly $2,000,000; sweet potatoes, onions and miscellaneous vegetables, nearly $5,000,000. Floriculture is an important industry, the receipts amounting to over $100,000.

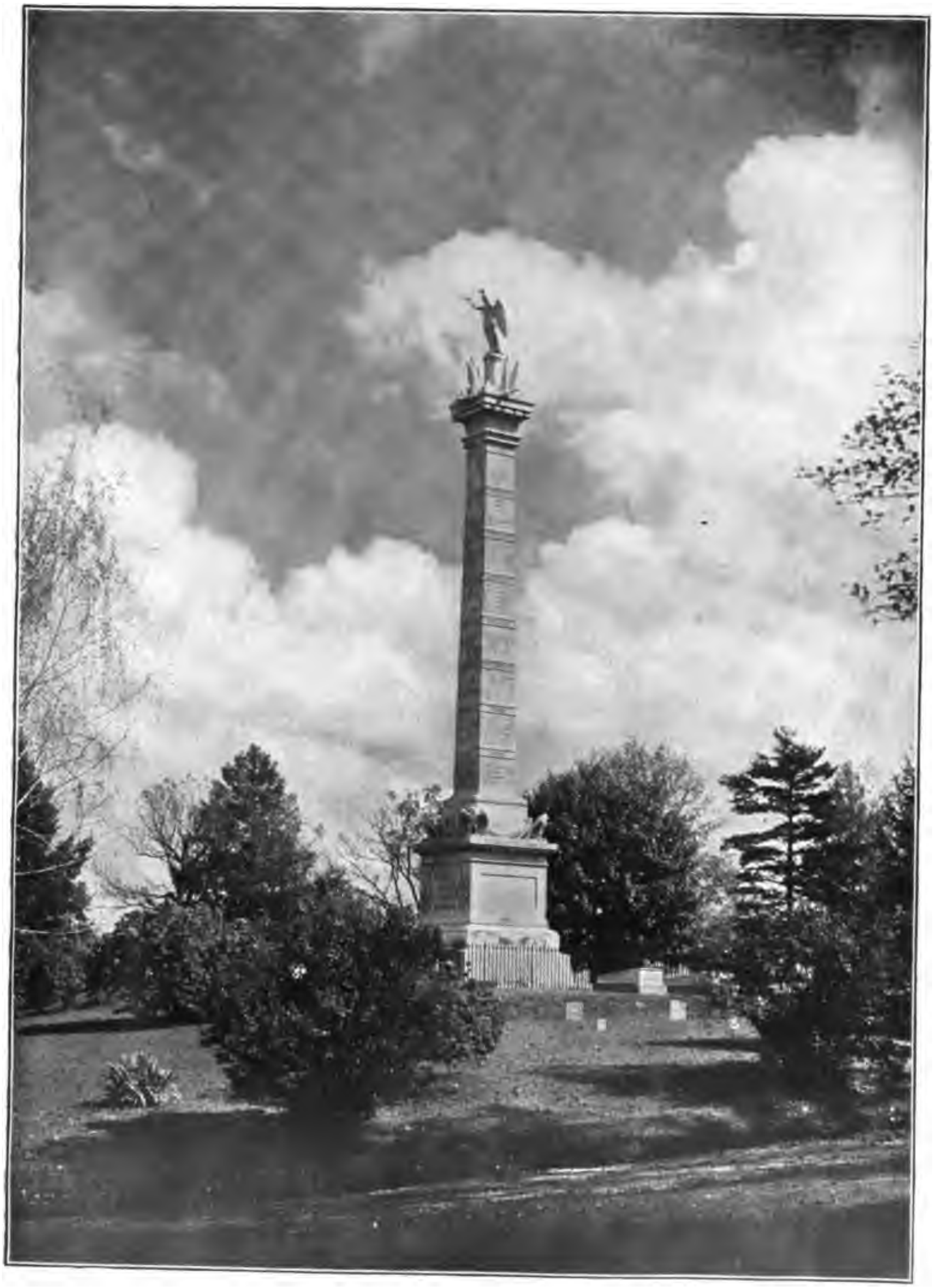
Stock-raising.— The mild winter climate, in which cattle can remain out all winter with little feed, the superb pasture afforded by blue grass, which forms a thick fine turf, and grows to perfection in the shade of the forests, and the abundant and excellent water, have given Kentucky unsurpassed natural advantages for rearing live stock. But these would not have availed but for a succession of breeders of rare intelligence and perseverance, who have made it the centre of the Union for high-grade blooded stock. Especially is this the case with horses. The old Virginia stock, bred from choice imported English animals, themselves bred to combine speed and endurance, were taken by the Kentucky breeders, the strains carefully kept pure except to mix with equally good fresh blood; and they have developed the finest road horses in the country, Kentucky horses it has been estimated have made three fourths of all the winnings on the American turf. There were in the State in 1900 over 450,000 horses valued at about $23,500,000 besides some 200,000 mules and asses. Dairy products were also of high importance, furnishing nearly $10,000,000 of product, from 364,025 cows. There were nearly 2,000,000 swine and 1,300,000 sheep, but both have been falling off for many years. The animals sold live and dead, came to about $25,000,000; the poultry and eggs to nearly $8,500,000.

Manufactures.—Kentucky has great natural facilities for manufacturing; her immense hardwood forests, her large coal fields, and plentiful natural waterways, for half a century and more after her admission to the Union kept her abreast of her western neighbors. But since then, there has been a relative falling off. In part it is due to the change in distribution of industries; the development of steam navigation threw Lexington, for instance, which in 1810 had 114 manufactures, into the shade to build up the river towns. But other causes — tardiness in extending railroad facilities to the forests and coal fields is held partially accountable, but this was itself due to general business conditions, and has been mostly remedied — have retarded it relatively, though not absolutely. In 1850 the number of wage-earners was 21,476, in 1900 62,962, but the former was 2.2 per cent of the total population against Ohio's 2.6, the latter 2.9 against Ohio's 8.5. The largest growth was in the decade 1880-90, the wage-earners increasing over 50 per cent. Tobacco is the foremost manufacturing industry, as it is the foremost agricultural product, and steadily growing. In 1900 the 337 establishments employed nearly one ninth of all hands, and turned out one seventh of all the product of the State's manufactories, to a value of $21,922,111, nearly double that for 1890. Over two thirds of this was chewing and smoking tobacco and snuff; the cigar manufacture, though the chief early one, having declined relatively. The industry dates from the 18th century, when tobacco was legal-tender currency; every town in the State had its small cigar factories, and many of the farms worked up their own product. Louisville has been for many years a principal leaf-tobacco market of the world, from its great facilities for distribution by river and rail; and tobacco industries of other kinds have therefore tended to concentrate themselves there, though Owensboro and Henderson have extensive establishments which prepare leaf for shipment. Flouring and grist-milling rank next with a product in 1900 of $14,515,161, an increase of 50 per cent. since 1890. Louisville has large flouring mills with a considerable export trade. Cottonseed oil and cake are important,— $4,683,000 in 1900. One of the great specialties of Kentucky for over a century has been corn whiskey, known as «Bourbon» from the county of Kentucky to which a number of western Pennsylvania «moonshiners» removed after the suppression of the Whiskey Insurrection (q.v.) in 1794; but the manufacture had been already established at Louisville in 1783, in three other towns soon after, and a Maryland colony in 1787 set up a number of distilleries along Salt River. For the management of the stills, see Internal Revenue System. Since the Civil War the old farm and village distilleries, producing one or two barrels a day, have mostly given way to mammoth establishments. But the total product is heavily declining, having dropped from $15,159,648 in 1890 to $9,786,527 in 1900. The manufacture of malt liquors, on the contrary, increased about one fourth; and is mostly concentrated in Louisville. In May 1902 there were 339 distilleries. The internal revenue receipts from the State in that year, mostly from liquors and tobacco, were $21,096,013.

Pork packing was an early industry in Kentucky, and from the first centred in Louisville. Louisville and Cincinnati were long the rival heads of the slaughtering and meat packing business in the United States; but the great northwestern grain fields have taken it from the Ohio Valley. The use of artificial ice, permitting summer packing, has caused a great revival of it in Louisville. The fortunes of packing and of mere slaughtering, however, are singularly in reverse; the former dropped in the decade from $2,966,227 to $635,685; the latter increased from $405,784 to $5,081,482. From the hides of these cattle was made leather to the value of $3,757,016. The chief agent is the bark of the chestnut oak, which is not only excellent for tanning, but has the great advantage over hemlock that cutting down the tree does not necessarily kill it as it does the latter; shoots spring from the stump, if the tree is not too old, and in about 20 years are fit for another stripping. The first large custom tannery was started at Louisville in 1848; that city now has a number, and is the centre of the manufacture, the establishments outside having mostly been abandoned. Sole leather and harness leather are the principal products, although some sheepskins are tanned for the manufacture of shoes and saddles. The industry has declined somewhat since 1883, its climax, but is still one of the leading specialties.

The exploitation of the rich forests now

KENTUCKY.



THE WAR MONUMENT AT FRANKFORT

going on its shown by the increase of lumber and timber products, from $7,904,428 in 1890 to $13,774,911 in 1900. Logging is an extensive industry on the upper waters of the Cumberland, Kentucky, and Licking Rivers; and the government improvements in the Kentucky, Green, and other rivers enable logs to be floated almost from their original home to the Ohio.

Of iron and steel, there were in 1900 eight establishments, employing 2,402 hands and turning out $6,676,093 worth of goods, an increase in the decade of over 150 per cent. The early furnaces were abandoned for lack of transportation facilities; in 1846 others were built at Eddyville on the lower Cumberland by William Kelly; and in 1851, five years before Bessemer patented his pneumatic process, Kelly began his «air-boiling» process, essentially the same, for turning iron into steel. During these years steamboats built at Cincinnati were using boiler plate practically the same as the Bessemer, but made by the Kelly process; and the latter finally secured a royalty.

Louisville is also one of the great centres of the manufacture of jeans clothing, from cloth made largely in the State mills; but of late years this has been partly replaced by the cassimeres. Louisville produces over half the total manufacturing product of the State, and its relative share is increasing.

Transportation.—Kentucky has 813 miles of navigable water on its boundary alone,—the Ohio 643 miles, the Mississippi west 50 miles, the Big Sandy east 120 miles. The Cumberland and Tennessee are navigated their entire course in the State; the Kentucky, Licking, Salt, and Green are more or less navigable for considerable portions of their lower courses, and some improvements have been made by dams and locks, but are little used. The great canal around the falls of the Ohio at Louisville has largely increased the value of that channel, which with the strip of the Mississippi is the creator of the State's commerce. The railroad system of the State has been greatly hampered by the difficulty of approach from the southeast over the mountains: several thousand square miles of this section, in a solid block, have not a mile of railroad track. This mountain district is a part of Appalachian America (q.v.) and presents, along with interesting Saxon survivals, grave problems in education and the enforcement of law. As the great transcontinental lines run mostly north of it, moreover, it has not been developed as other sections. The State has now about 3,300 miles of railroad in operation; the chief systems are the Louisville & Nashville, the Queen & Crescent, the Illinois Central, and the Chesapeake & Ohio.

Banks.—For the establishment of the banking system, see *History*. The great landmarks are the establishment of the Bank of Kentucky at Frankfort in 1806, and that of the Louisville clearing-house in 1875, which has more than once saved the more solid banks of the State from catastrophe. In 1902 there were 95 national banks in operation, with capital of $13,334,000, surplus of $4,015,000, cash and other items, $3,904,000, loans $37,976,000, deposits $30,577,000; 229 State banks, with $9,264,000 capital, $2,110,000 surplus, $3,805,000 cash, etc., $29,999,000 loans, $32,045,000 deposits; and 22 private banks, with $606,000 capital, $163,000 surplus, $297,000 cash, etc., $2,513,000 loans, $3,233,000 deposits. The exchanges of the United States clearing-house at Louisville and Lexington for the year ending 30 Sept. 1901 aggregated $480,595,304.

Education.—In 1901 there were 7,900 white and 1,157 colored teachers in the State, the males slightly in excess among the white teachers, females considerably so among the colored; average monthly salary of whites $40.60, of colored $29.95; of men $44.03, of women $37.18. The average length of school term was 115 days; this, however, does less than justice to the cities and much more than justice to the rural districts. Entering the Union at an early date, Kentucky failed to receive the land grants which have given rise to large school funds in some other States; and the sentiment for universal education could not become prevalent until after the abolition of slavery. In the cities and among the wealthy, private schools absorbed the interest of the people, so that public education languished until recent years. At present many of the cities and larger towns, as Louisville and Ashland, have very creditable public high schools. The condition of the rural schools is unsatisfactory. The unpaid local trustees prove inefficient, and the erection of school-houses is hindered by legal difficulties over the raising of taxes. School legislation has been wisely adapted to meet the conditions in which the State is placed. The local teachers are paid from a general State fund, so that the richer portions of the commonwealth assist the poorer parts. The election of a superintendent of public instruction in each county is an arrangement contributing to progress. The public instruction provided for the colored people is in separate schools under colored teachers. The difficulties of maintaining schools in the mountain counties, and the impossibility of at once bringing under instruction the negro population, formerly enslaved, gives the State a poor showing in the matter of illiteracy. However, Kentucky is in better condition than most southern commonwealths and shows gratifying evidences of progress: 13.9 per cent. of its white voters are illiterate, and 49.5 per cent. of its negro voters. The expenditures for school purposes in 1900 were $2,650,100.

For higher education there were in 1900, 69 public high schools, 82 private secondary schools, 6 public and 8 private normal schools, 13 colleges for men, or coeducational, and 11 colleges for women alone. The Kentucky University, which has had a long and varied history, is now controlled by the Disciple denomination. Center College at Danville (Presbyterian) has been the Alma Mater of many distinguished men, and recently, in combining with Central University, has taken that name. Other schools under religious auspices are, Georgetown College (Baptist) at Georgetown; and Wesleyan College (Methodist, South) at Winchester; Berea College (religious but not sectarian) at Berea, was founded by the anti-slavery element which existed in Kentucky before the War, and has in addition to the ordinary college courses, large normal and industrial departments with special adaptations to the needs of the mountain region. Receiving «all young people of good moral character» it has an attendance of colored students comprising about one seventh of the whole number. The «State College» at Lexington occupies the position of a State university, enjoying the funds provided by the United States government for «instruction in Agriculture and the Mechanic Arts,» and affording special opportunities for the study of the natural sciences. The medical schools of Louisville are attaining reputation and importance. And that city is also the seat of a Baptist and a Presbyterian Theological Seminary.

Churches.— No religious census has been taken since 1890; but no considerable changes have taken place since that date, when the Baptists were far in the ascendant, though divided into «missionary,» «predestinarian,» and other varieties. Methodist Episcopal South is next in size; then came in order the Disciples of Christ, the Methodist Episcopal, the Colored Baptist, the Roman Catholic, the Cumberland Presbyterian, the African M. E., the African M. E. Zion, and the Protestant Episcopal.

Charitable and Penal Institutions.—There are insane asylums at Lexington, Hopkinsville, and Anchorage; a notable institution for the education of the blind at Louisville; a State school for deaf-mutes at Danville; and an institution for feeble-minded children at Frankfort, which, however, restricts the ages to the period of six to 18, and requires that they shall not be too feeble-minded for training. The State penitentiaries are at Frankfort and Eddyville.

Government.—The State officers are elected for four years, on the November preceding the Presidential election; they cannot be re-elected. The governor has a veto by items, but a majority vote overrides it. If he dies in the first two years of his term, a new election is held; if later, the lieutenant-governor and the president of the senate succeed in order. The legislature consists of 38 senators chosen for four years, and 100 representatives for two years. Sessions are biennial, and limited to 60 days (legislative days). Provisions concerning revenue bills and impeachments follow the model of Congress. Women (by a law of 1902) can hold office on school boards. No State, county, city, or town officers except members of city legislative boards can be elected in the year of a Presidential election. The judiciary is headed by a Court of Appeals, consisting of not over seven or under five elective judges, with terms of eight years. There are no townships, only «magisterial districts,» and the county, as in old Virginia is the political unit. Each county is entitled to three sittings of a circuit court each year. The circuit judges are elected for six years, in districts. There is a county judge, and a monthly court day. County officers are elected for four years, except a circuit court clerk for two years, and the sheriff is ineligible to re-election except in alternate terms. Counties must have a minimum area of 400 square miles, and the county-seat must be at least ten miles from the boundary. There are 11 representatives in Congress.

Finance.—The State's assessed valuation in 1902 was $667,056,375; the bonded debt, $1,171,394. The tax rate was $5 per $1,000. The State revenues are divided into «funds,» for different departments; the «general expenditure» fund is unfortunately fixed too low and entirely inadequate to the needful expenses, so that the State expends about double the amount of the fund, giving an appearance of a large deficit which is not correct as to the resources or income as a whole. The financial world, however, takes note of this fact, and Kentucky has perfectly good credit.

Population.—The population of the State at the various censuses has been as follows: 1790, 73,677; 1800, 220,955; 1810, 406,511; 1820, 564,135; 1830, 687,917; 1840, 779,828; 1850, 982,405; 1860, 1,155,684, including 10,684 free negroes, and 210,981 slaves; 1870, 1,648,690; 1880, 1,858,635; 1900, 2,147,174. The foreign-born were but 50,249; considerably more than half Germans, about 10,000 Irish. The colored population was 284,865, not so large as in 10 other States, and not so large a percentage as in 17 others; nor are the colored people increasing so fast as the whites, there having been a relative decrease for the past two decades. The agricultural characteristics of the State have prevented the over-development of specially slave industries, and the mountain districts of course have very few. There seems also to have been some tendency among the negroes to emigrate, and a large emigration of whites is continually going on, so that natives of Kentucky form a notable element in Ohio, Indiana, Missouri and the West.

The one great independent city of Kentucky is Louisville (204,731) at the falls of the Ohio, the third in size on the river, excelled only by Cincinnati and Pittsburg. Covington (42,938), Newport (28,301), Bellevue (6,332) and Dayton (6,104) are virtually suburbs of Cincinnati, the first-named west of the Licking, the last three east of it. Other cities on the Ohio, which monopolizes much the greater part of the urban development and manufacturing of the State, are in the west, Paducah (19,446) at the mouth of the Tennessee, Owensboro (13,189) and Henderson (10,272); in the northeast, Maysville (6,423); on the east, Ashland (6,800), now the head of a rapidly growing iron district. Lexington (26,369), formerly the capital, once called «Athens of the West,» is the head of the Blue Grass region. Frankfort (9,487), the capital, on a magnificent gorge of the Kentucky River; Bowling Green (8,226), the head of navigation on the Barren River, a tributary of the Green; Hopkinsville (7,280) in the southwest; and Winchester (5,964) in the north centre, are the only other places of over 5,000.

History.— The earliest explorers found this territory, though formerly inhabited by mound-building, agricultural Indians and presenting every advantage to such tribes, practically deserted, save at two points on the Mississippi and Ohio. It was a ground contested by powerful tribes, who slaughtered any others attempting to hunt there. Kentucky was originally a part of Fincastle County, Virginia, explored by Boone and his companions, as well as previous travelers, soon after 1760. The first settlement was at Harrodsburg in 1774. Boonesborough was founded the following year. With the exception of French settlements, these two towns are the oldest in the West. In the former year the victory at Point Pleasant forced the northwestern Indians to give up their claims, and the «Transylvania Company» (Richard Henderson and associates) bought about 2,500 square miles west of the Kentucky River, from the Cherokees, whose chief told Henderson he «had bought a fine territory but might have some little difficulty in occupying it»; in fact, the settlement was harassed by bloody Indian wars, and

Virginia refused to confirm the sale. In 1776 the district was organized as Kentucky County. As the scene of the principal exploits of Daniel Boone, and the birthplace of Kit Carson, Kentucky's early history was typical of American pioneer life. Its separation from Virginia cost seven different conventions, the last in 1790; besides an attempted Spanish intrigue for its withdrawal from the Union and the setting up of an independent government with a Spanish Protectorate. Kentucky was finally admitted to the Union 1 June 1792. Under the influence of Henry Clay and his associates, Kentucky was a strong Whig State with antislavery tendencies. With its diverse elements of mountains and Blue Grass, anti-slavery and pro-slavery sentiment, the State naturally hesitated at the opening of the Civil War, at first assuming an attitude of «strict neutrality,» which was at last exchanged for a stand for the Union. It filled its full quota of Union soldiers under Lincoln's various calls, while half as many more went southward to join the armies of the Confederacy. The commonwealth had thus brilliant representatives in both armies, and suffered as a border State from the invasion of Bragg in '62, and the continual raids of Morgan. The State refused Lincoln's overture for compensating slave-holders if it would abolish slavery, and that institution was finally swept from existence by the amendments to the Federal Constitution. Disgust over this loss, and resentment at some of the acts of the Federal commanders in the State, alienated so many Union men that the State has since been largely Democratic. Since the Civil War the commonwealth has made steady if not rapid progress in education and wealth.

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President Berea College, Berea, Ky.

Kentucky, Agricultural and Mechanical College of, a coeducational institution at Lexington, Ky., founded in 1865. It has agricultural, engineering, scientific, and collegiate courses which lead to the bachelor's degree; it has also a preparatory department. The campus contains 52 acres, presented by the city of Lexington, and the experiment station farm contains 48 acres. The income for 1901 was, from the State, $42,810; from the Land Grant Fund of 1862, $12,967; from the Federal Government (act of 30 Aug. 1890), $21,375; tuitions, $1,582; miscellaneous, $31,552; incidental fees, $673; making a total of $110,959. The Federal appropriation for the experiment station was (1901) $15,000. The income in 1902, derived from the Land Grant Fund, the State and the Federal appropriations, was $106,252. The number of instructors in 1902 was 42, and the number of pupils in attendance was 611. The number of volumes in the library, about 6,000.

Kentucky Bluegrass. See Grasses.

Kentucky Coffee-tree, a large tree (*Gymnocladus dioica*), allied to the locusts and red-buds of the family *Cæsalpinaceæ*, and growing rather sparsely throughout the middle region of the Mississippi Valley. It bears greenish-white flowers growing in terminal racemes; and these produce in early autumn legumes, broad and 6 to 10 inches long, containing several hard gray seeds. These seeds are locally called «coffee-nuts,» because the early settlers of Kentucky tried to use them as a substitute for coffee. The timber is suitable for cabinet work; the bark is very bitter, and contains saponine. When bare of foliage in winter this tree presents such a forlorn appearance that it is called «stump tree.»

Kentucky Resolutions, a famous series of nine resolutions introduced into the Kentucky legislature in 1798, by George Nicholas, though it was afterward known that Thomas Jefferson was the author of them. They were directed against the Alien and Sedition laws, and against acts passed to punish frauds on the Bank of the United States, and emphasized the rights of the several States. These resolutions were the outgrowth, together with a similar series known as the Virginia Resolutions, of a feeling that the Federal party was making a strained and illegitimate use of the powers granted to the Federal government by the Constitution. The Kentucky Resolutions were passed for the purpose of defining the strict-construction view of the relative powers of State and Government. They declared that the Union was not based on the «principle of unlimited submission to the General Government»; that the Constitution was a compact, to which each State was a party as over against its fellow States; and that, in all cases not specified in the compact, each party had a right to judge for itself, as well of infractions as of the mode and measure of redress. They proceeded to set forth the unconstitutionality of the Alien and Sedition Acts, and invited other States to join in declaring them void. No favorable response was evoked. In 1799 the Kentucky legislature went further, and declared a nullification of a Federal law by a State to be the rightful remedy in cases of Federal usurpation. Upon these resolutions the doctrines of nullification and secession were later founded.

Kentucky River, a river of Kentucky, formed by two forks which rise in the Cumberland Mountains, and, after a winding northwest course of about 250 miles, enters the Ohio, 12 miles above Madison, Ind., midway between Cincinnati and Louisville. The river runs through part of its course between perpendicular limestone walls. It is navigable by steamboat beyond Frankfort, a distance of 60 miles, and flatboats can ascend 100 miles farther.

Kentucky University, an educational institution at Lexington, Ky., under the control of the Christian Church. It was founded in 1836 under the name of Bacon College at Georgetown; the name was changed in 1858, and it was later consolidated with Transylvania University, which was situated at Lexington. Its present organization comprises the college of liberal arts, with classical, literary, and scientific courses, the commercial department, the college of the Bible, and the medical department; of these the first two are coeducational; the last is situated at Louisville. In 1903 the number of students was 1,200; instructors, 60; the annual income amounted to $27,000; the library of about 18,500 volumes had been consolidated with that of the city of Lexington.

Kentucky Warbler. See Warbler.

Ken'yon, James Benjamin, American poet and Methodist clergyman: b. Frankfort, N. Y., 26 April 1858. After his graduation from Hungerford Collegiate Institute in 1875, he studied theology, entered the Methodist ministry and has since held several pastorates. He is well known among American verse writers of the present, his published collections of poems including: 'The Fallen and Other Poems' (1876); 'Out of the Shadows' (1880); 'Songs in All Seasons' (1885); 'In Realms of Gold' (1887); 'At the Gate of Dreams' (1892); 'A Little Book of Lullabies' (1898). In prose he has published 'Loiterings in Old Fields' (1901).

Kenyon College, founded in 1824, at Worthington, Ohio, under the auspices of the Protestant Episcopal Church. It was then called Theological Seminary of the Protestant Episcopal Church, in the Diocese of Ohio. In 1827 it was removed to Gambier, Ohio, where it is now. In 1891 the name was changed to Kenyon College. The school is now composed of a preparatory department, a college, and a theological seminary. In 1903 the endowment fund was $501,000. Marcus A. Hanna gave (1901) $60,000 to aid in the building of a new dormitory. The number of professors and instructors, in 1903, was 28, and the number of students, 203. On the graduate roll of this school are the names of many distinguished men, among them Rutherford B. Hayes and Edwin M. Stanton.

Keokuk, kē'ō-kŭk, Iowa, city, one of the county-seats of Lee County; on the Mississippi, near the mouth of the Des Moines River, and on the Toledo, P. & W., the Wabash, the Chicago, B. & Q., the St. Louis, K. & W., and the Keokuk & W. R.R.'s. The river at this point falls about 21 feet in 11 miles, thus furnishing great water-power. A ship canal has been built around the rapids at this place, at a cost to the Federal government of nearly $8,000,000. It was first used in 1877. The chief manufactures are stoves, tin cans, cereals, flour, boots and shoes, ready made clothing, gunpowder, lumber, canned fruits and pickles. It has a poultry-packing plant, wholesale stores, cold storage buildings for meat, vegetables, and fruits. Its excellent transportation facilities by land and water make it a trade centre for a large extent of country in Iowa, Missouri, and Illinois. The iron bridge which here spans the Mississippi is over 2,000 feet in length. Rand Park is noted for being the burial-place of the Indian chief, Keokuk. Keokuk has a medical college founded in 1849, a dental college, a government building, a public library which contains about 18,000 volumes; Saint Joseph's Hospital, Home for the Friendless, a high school, Saint Vincent's Academy, a Y. M. C. A. building, and an opera house. It is one of the four cities of the State which are governed by a special charter. The difference in the form of government is chiefly in the way of appointment of the subordinate officials. Some are appointed by the mayor, others by the council; and the park commissioners, city weigher, and library committee are appointed by the mayor, subject to confirmation by the council. Pop. (1900) 14,641. Consult 'Annals of Iowa.'

Keokuk Moses, an American Indian of the Sac and Fox tribe, after whom the city of Keokuk, Iowa, was named: b. 1818; d. near Kansas City, Mo., October 1903. Probably the best description of Keokuk's boyhood is contained in Drake's 'History of the North American Indians.' It tells of his visit to Washington after the Black Hawk war. Keokuk succeeded his father as chief of the Sac and Fox tribe, and removed with his people from Quenemo, Kan., to their reservation in what is now Oklahoma, in 1868.

Kepler, Johann, yō'hän kĕp'lĕr, German astronomer: b. Weil der Stadt, Würtemberg, 27 Dec. 1571; d. Ratisbon 15 Nov. 1630. He studied at the University of Tübingen, and in 1593 he was appointed a teacher of mathematics at Gratz (Styria). Here he devoted himself with much ardor to the study of astronomy; but in 1599 religious persecutions commenced in Styria, and Kepler, being a Protestant, gladly accepted Tycho Brahe's invitation to Prague, to assist in the preparation of the new astronomical tables, called the Rodolphine Tables. Tycho died in 1601, and Kepler continued the work alone, being appointed imperial mathematician and astronomer. After 25 years' incessant labor the tables were published in 1627 at Ulm. Kepler had become the possessor of all Tycho's papers, and the mass of observations made by that astronomer during 20 years, with a precision till then unsurpassed, enabled Kepler to establish the famous 'Kepler's Laws' (q.v.), which have proved so fruitful in the development of astronomical science. Kepler enjoyed the patronage of the emperors Rodolph and Ferdinand, the dukes of Würtemberg and Wallenstein, but his life was a continued struggle; he was exposed to much religious persecution, and his domestic relations were equally unfortunate. The latter part of his life was chiefly passed at Linz as professor of mathematics. He wrote much, but the work that has rendered him immortal is his 'Astronomia Nova, seu Physica Cœlestis tradita Commentariis de Motibus Stellæ Martis' (New Astronomy, or Celestial Physics delivered in Commentaries on the Motions of Mars) (1609). His 'Harmonice Mundi' appeared in 1619; and among other works may be cited: 'De Stella Nova in Pede Serpentarii' (1606); 'De Cometis' (1613); 'Chilias Logarithmorum' (1624). Consult: Breitschwert, 'Johann Keplers Leben und Wirken' (1831); Reitlinger, 'Johann Kepler' (1868); Reuschle, 'Kepler und die Astronomie' (1871); Hasner, 'Tycho Brahe und Kepler in Prag' (1872).

Kepler's Laws, in astronomy, three laws discovered by Johann Kepler (q.v.) on which were founded Newton's discoveries, as well as the whole modern theory of the planets: (1) Every planet describes an ellipse, the sun occupying its focus. (2) The radius vector (line joining the centre of the sun with the centre of the planet) of each planet sweeps over equal areas in equal times. (3) The squares of the periodic times (the periods of complete revolution round the sun) of two planets are proportional to the cubes of their mean distances from the sun. These laws enabled Newton to determine the laws of the attraction of gravitation.

Kep'pel, Augustus, British admiral: b. 25 April 1725; d. 2 Oct. 1786. He was the second son of the Earl of Albemarle, entered the sea service at an early age, and in 1755 commanded the North American squadron in Hampton Roads. He was placed in command of the Channel fleet in 1778, and in July of that year engaged the French fleet off Ushant. Having become partly disabled he signaled for his van and rear divisions, but Palliser in command of the rear ignored the signal until too late. Palliser accused him of incapacity and cowardice, but Keppel was honorably acquitted. In 1782 he was raised to the peerage under the title of Viscount Keppel and Baron Eldon. He was first lord of the admiralty 1782–3.

Kepp'ler, Joseph, American caricaturist: b. Vienna, Austria, 1 Feb. 1838; d. New York 19 Feb. 1894. He early made his reputation as a satiric artist and the leading periodicals of his native city were publishing his witty sketches, almost before he had left the Academy of Fine Arts. But art was not then a serious business to him, and he took to the stage as a comedian and opera singer, and actually began to study medicine at St. Louis, Mo., where he made his residence in 1868. But it was in St. Louis that he found his real vocation. There he established the German ‹Puck,› which, while it failed as a commercial enterprise, made his reputation. It was seen at once that a caricaturist of rare skill as a draftsman, of mental fertility and freshness, of witty and incisive satire, had appeared. He was engaged from 1872 to 1877 as caricaturist for ‹Frank Leslie's Illustrated Newspaper› in New York, to which city he had removed, and in 1875 he started a New York German ‹Puck› in association with Adolph Schwartzman. This was followed in 1877 by the English ‹Puck.› He was the first to use colored cartoons in caricature, and drew upon a vast store of classical and historical incidents for adaptation in criticising modern social and political life.

Ker'atin (from Gr. *keras,* a horn), a substance obtained from claws, feathers, hair, horn, nails, wool, and other epidermal appendages. This tissue or substance is distinguished from gelatinous tissue by becoming soft when acted on by water for some time, but no glue is produced. It is insoluble in alcohol and in ether.

Kerguelen (kĕrg'ē-lĕn) **Land,** or **Desolation Island,** an island in the Indian Ocean, intersected by lat. 49° 3′ S., lon. 68° 18′ E.; length about 100 miles; greatest breadth about 50 miles. It has a remarkably barren and desolate appearance, due to the fact that it consists of lofty masses of basalt and other volcanic rocks. These rise to the height of 2,500 feet, presenting numerous bold headlands and ranges of precipitous cliffs, and possessing a very scanty vegetation. Sea-fowl are numerous, but no land animals are known to exist on it. Its indentations furnish several bays and inlets affording good harbors. It was annexed by France in 1893, and some settlers have made their abode there. Of the flora, which is arctic, the most noteworthy species is the Kerguelen cabbage (*Pringlea antiscorbutica*), a large edible plant, in many ways resembling common garden cabbage, and which has been valued on account of its antiscorbutic properties.

Kermes, kĕr'mēz, dried female scale insects (*Coccus ilicis*) found in many parts of Asia and South Europe on the leaves of an oak (*Quercus coccifera*), supplying a durable red and scarlet dye. They have been utilized for dyeing purposes in the East from very ancient times, but since the introduction of cochineal (q.v.) their use is confined to the Eastern countries and Spain, where the collection of these insects still gives employment to a number of people, but is diminishing under the competition of the aniline dyes.

Kermes Mineral, a name given to amorphous antimony trisulphide. The native antimony trisulphide occurs in well-developed orthorhombic prisms. When this compound is fused for some time, and suddenly thrown into cold water, its crystalline structure is entirely destroyed. Kermes is a brown-red powder, becoming blackish-gray when washed with boiling water. By fusion it may be obtained as a solid mass, but it is totally devoid of crystalline structure. See ANTIMONY.

Kermess, kĕr'mĕs, **Kirmess,** or **Kermis,** formerly a church festival held by the Dutch and in Flanders, and later in other parts of Europe, on the feast-day of the principal saint of a place or church. In the United States the word has come into general use for entertainments given for charitable purposes.

Kern (kĕrn) **Lake,** a body of water in Kern County, in the southern part of California; one of a small group of basins in the midst of an almost arid part of the State. Part of the year there is no apparent outlet, but at the period of high water the lake overflows into Kern River. The country around this lake and in the vicinity is noted for its large amount of game.

Kern River, a stream in the southern part of California; almost its whole course is among the mountains of the southeast. The country in the vicinity is noted for game, and at one time valuable mining interests. In the western part of Kern County, the slough of the Kern River occupies an area of about 80 square miles. It flows into Tulare Lake. The Edison Company of Los Angeles are using the valuable water power of this river for their electric-power plant established on this river.

Kernahan, kĕr'nā-ạn, **Coulson,** English novelist: b. Ilfracombe, Devonshire, 1 Aug. 1858. He was educated at St. Albans, and afterward privately by his father, a scientist and Biblical scholar. He has contributed to most of the principal English and American periodicals, and has written: ‹A Dead Man's Diary›; ‹A Book of Strange Sins›; ‹Sorrow and Song›; ‹God and the Ant›; ‹The Child, the Wise Man and the Devil›; ‹A Literary Gent›; etc. He has been for many years literary adviser to Ward, Lock, and Company.

Kernstown, Battle of. Gen. «Stonewall» Jackson abandoned Winchester, Va., 11 March 1862 and retreated up the Shenandoah Valley, followed by Shields' Union division beyond Strasburg. Shields was recalled to Winchester on the 20th, and Jackson followed him, his advance cavalry under Turner Ashby engaging Shields on the afternoon of the 22d, near Kernstown, in which Shields received a severe shell-wound. Jackson came up on the afternoon of the 23d and, being informed that Williams' division of Banks' corps had left Winchester and was moving through the Blue Ridge for Manassas Junction, and that Shields had but four regi-

ments in his front, determined to crush these and thus recall Williams and detain him in the valley. Shields had nearly 8,000 infantry and cavalry and 24 guns, two of his brigades on a ridge covering the road half a mile north of Kernstown, both under command of Col. N. Kimball. Jackson had about 3,000 infantry and 27 guns. Kimball was too well posted to be attacked in front, so leaving Ashby with the cavalry and a small brigade of infantry to hold the road and threaten Kimball's centre and left, Jackson seized a low ridge on Kimball's right, and placed on it his artillery and infantry. Tyler's brigade, which had been held in reserve, was brought up and made unsuccessful efforts to dislodge him, upon which Kimball, drawing from his left and centre, formed a column of seven regiments and, under a terrific fire of artillery and musketry, led it forward, came up on Tyler's left and after a fierce combat broke Jackson's line. Kimball pressed his advantage, and as night closed in, Jackson was in full retreat, leaving his dead and wounded and two guns on the field of his first defeat. He said that he considered the engagement "a fiercer fight during its continuance than any portion of the battle of Manassas." The Union loss was 118 killed, 450 wounded, and 22 missing; the Confederate loss, 80 killed, 375 wounded, and 263 missing. Consult: 'Official Records,' Vol. XII.; Allan, 'Jackson's Valley Campaign'; The Century Company's 'Battles and Leaders of the Civil War,' Vol. II.
E. A. Carman.

Kernstown (Winchester), **Second Battle of.** On 22 July 1864 Gen. Crook, with four small divisions of infantry and cavalry, joined Gen. Averell's cavalry division at Winchester, Va., Crook assuming chief command of the united force of 11,000 men. On the 23d Crook advanced four miles south to Kernstown and skirmished with Confederate cavalry, and on the 24th went into position on the same ground held by the Union troops in the battle of 23 March 1862. The infantry divisions of Cols. Thoburn, Duval, and Mulligan covered the valley pike, with the cavalry of Duffié and Averell on either flank. Upon the approach of the enemy Averell was sent down the Front Royal road to turn his right. Gen. Early, who, after his raid on Washington, had recrossed the Potomac and taken position beyond Cedar Creek on the 21st, hearing of Crook's advance, put all his army in motion on the morning of the 24th to attack him. At Bartonsville Ramseur's division moved by a road to get around Crook's right, while the divisions of Gordon, Rodes, Breckinridge, and Wharton moved along the valley pike and on either side of it. The cavalry was divided and moved in two columns, one on the right along the Front Royal and Winchester road, the other on the left and west of Winchester, the two to unite in rear of Winchester and cut off Crook's retreat. At 10 A.M. Crook's skirmishers were driven in, and it was discovered that his left extended through Kernstown, and that Averell having left, that flank was exposed; whereupon Wharton's division was moved under cover of some ravines on the right to attack it. The movement was promptly executed, and Wharton struck the left flank and rear of Col. Rutherford B. Hayes' command as it was advancing and threw its left into some confusion. Hayes changed front and, forming behind a stone fence, held Wharton in temporary check. Almost simultaneously with Wharton's flank attack, Rodes, Gordon, and Ramseur advanced on Crook's centre and right, and the entire line gave way and retreated through Winchester, followed by Early's infantry and artillery beyond Winchester, and by Rodes' division as far as Stephenson's Depot. The retreat was continued on the 25th through Martinsburg to the Potomac, Crook crossing at Williamsport and marching down the north side of the river to Maryland Heights and Harper's Ferry. Early occupied Martinsburg and began the destruction of the Baltimore & Ohio railroad. The Union loss, 23–26 July, was 100 killed, 606 wounded, and 479 missing. Among the mortally wounded was Col. Mulligan, commanding division. The Confederate loss is not accurately known, but it was comparatively light. Consult: 'Official Records,' Vol. XXXVII.; Pond, 'The Shenandoah Valley in 1864'; The Century Company's 'Battles and Leaders of the Civil War,' Vol. IV.
E. A. Carman.

Ker'osene, an illuminating oil; the principal product of the distillation of petroleum, the crude domestic oil yielding 70 per cent. of its weight. The oil is colorless, possessing a characteristic taste and smell; insoluble in water, moderately soluble in alcohol, but very soluble in ether, chloroform, and benzene. It dissolves camphor, iodine, phosphorus, sulphur, fats, wax, and many resins. The flashing point of a safe kerosene should not be less than 34°, and the igniting point 43°. The finest quality of illuminating oil is produced from distillates ranging in specific gravity from 0.775 to 0.780. It has a high flashing point, 48° to 60°, and contains none of the lighter parts of the crude oil. A good illuminating oil should neither be too viscous nor too volatile, and it should not take fire when a light is applied to it. See Oil; Petroleum.

Kerr, kėr, **Michael Crawford**, American politician: b. Titusville, Pa., 15 March 1827; d. Rockbridge, Alum Springs, Va., 19 Aug. 1876. He was graduated from the law school of Louisville University in 1851. The next year he moved to New Albany, Ind., and began the practice of his profession; in 1854 he was city attorney, and in 1855 prosecuting attorney for the county. In 1856 he was elected to the State legislature; in 1862 he was reporter for the supreme court of Indiana, and published five volumes of reports of unusual value. In 1864 he was elected to Congress as a War Democrat, and served till 1872. In that year he refused the nomination from his own district, but ran as congressman-at-large, and was defeated by a very small majority; in 1874 he was re-elected to Congress in spite of much opposition, and was made speaker on the organization of the House. He served however only during the first session of that Congress (the 44th), as he died four days after its adjournment. While a member of the House he served on several important committees, including the committee of ways and means; he opposed the reconstruction policy of the Republican party and was an advocate of free trade. He was also a close student of financial problems, favored the resumption of specie payment, and was strongly against the Greenback movement in regard to which he opposed a large part of his constituency and many of the politicians of his State.

Kerr, Orpheus C. See Newell, Robert Henry.

Ker'ril, a sea-snake (*Distira cyanocincta*), olive with blue-black bands, numerous along the coasts from Persia to Japan, and considered one of the most venomous of its race. See Sea-Snake.

Kerrville, kėr'vĭl, Texas, town, county-seat of Kerr County; on the Guadalupe River, and on a branch of the San Antonio & A. P. railroad. It is situated in an excellent agricultural region in which cotton cultivation and sheep raising are the principal occupations. The altitude of the town is about 1,800 feet, which accounts for its agreeable climate. The chief industrial establishments are stock-yards, flour-mills, cotton gins and, in the vicinity, stone quarries. The town has considerable trade in lumber, and is one of the principal wool markets of the State. Pop. (1900) 1,423.

Kersey, kėr'zĭ, a kind of woolen cloth, differing from broadcloth by being woven as a twill. A very thin fine variety of kersey is called cassimere.

Ker'shaw, Joseph Brevard, American soldier: b. Camden, S. C., 5 Jan. 1822; d. there 13 April 1894. He entered the Confederate army at the outbreak of the Civil War, and as brigadier-general commanded a brigade in the Peninsular campaign of 1862. He took part in the capture of Harper's Ferry, 15 Sept. 1862, and was active at Antietam, Fredericksburg, Chancellorsville, Gettysburg, and Chickamauga. After the War he became president of the South Carolina Senate, and was judge of the 5th circuit of South Carolina, 1877–93.

Kes'trel, one of the smaller of the European falcons (*Tinnunculus alaudarius*), resembling the sparrow-hawk, and formerly much used in falconry by the peasantry. The American sparrow-hawk and sharpshin (qq.v.) may be called kestrels.

Ketch, a vessel equipped with two masts, namely, the mainmast and the mizzenmast, and usually from 100 to 250 tons burden. Ketches were principally used in former times as yachts for conveying princes of the blood, ambassadors, or other great personages from one place to another. Ketches in use at the present day are chiefly coasters.

Ketones, kē'tōnz. See Acetone.

Ketteler, kĕt'tĕl-ĕr, **Clemens August,** Baron von, German diplomat: b. Potsdam 1853; d. Peking 20 June 1900. He served for a time in the army, but entered the diplomatic service, in 1882 as attaché at Peking drew up the first treaty between Germany and Korea, in 1883 was appointed acting consul at Canton, in 1892 became secretary of the German legation at Washington, and when in 1893 the legation was made an embassy was appointed first secretary to the embassy and councillor of state. In 1896 he became minister to Mexico, in 1899 minister to China. In 1900, at the time of the «Boxer» disturbance in northern China, he was selected, owing to his familiarity with the Chinese language, to represent the foreign diplomats in their communications with the government. While on such a mission he was shot in the street. Prince Chun, brother of the emperor, was sent to Germany to apologize for the murder, and 18 Jan. 1903 a memorial arch, set up at the expense of the Chinese government, was dedicated at Peking.

Kettle Drum, a musical instrument, formed of thin copper, and has a head of parchment or vellum. Kettle drums are used in pairs, slung on each side of the withers of a cavalry horse. One drum is tuned to the key note, and the other to the fifth of the key in which the piece in which they are to be used is written. The tuning is by a hoop and screws. Also a name for a tea party held by fashionable people in the afternoon before dinner.

Ketu'pa, the generic and vernacular name of a group of large owls of the East Indies, specifically the Javan one (*K. javanensis*), which subsist mainly on fish, crabs, and the like, which they are expert in catching along the shores of sea and rivers. Their legs and talons are long and not feathered.

Keuka (kė-u'ka̤) **Lake,** or **Crooked Lake,** a body of water in New York State extending from Steuben County to Yates County, a distance of 20 miles. It is about 2 miles wide and of irregular form. It has a depth of 200 feet and lies 718 feet above the sea. Steamboats navigate the lake in summer between Hammondsport and Penn Yan.

Keuka College, N. Y., a college at Keuka Park; founded in 1892 under the auspices of the Free Baptists. It had in 1901: Professors and instructors, 15; students, 176; volumes in the library, 3,000; productive funds, $150,000; income, $11,000.

Kew, kū, England, a small village in the county of Surrey, on the right bank of the Thames, opposite Brentford, with which it is connected by a bridge. The royal botanic gardens and the connected pleasure-grounds, the former covering about 75 acres, the latter 250, are the chief attraction of visitors to Kew. They contain the finest collection of plants in the world, and are decorated with various ornamental buildings, including a Chinese pagoda 163 feet high. The botanical constructions here are really magnificent, and have been much augmented in recent years; they include a great conservatory for palms, tree-ferns, and other tropical plants, 362 feet long altogether, the centre portion being 137 feet 6 inches long, 100 feet wide, and 69 feet high, the wings 50 feet wide and 33 feet high; a house for succulent plants, such as cactuses, euphorbias, etc., 200 feet long and 30 wide; a great «temperate house» for trees and shrubs of temperate climates that require protection during the winter; a large orangery, hothouses, greenhouses, etc., of great size. The gardens are open to the public on Sundays as well as week days.

Kew Observatory, a celebrated astronomical structure in Richmond Park, between Kew and Richmond, Surrey, England. It was built by George III. as a private enterprise for the observation of the transit of Venus in 1769 and was then called the King's Observatory. It was transferred to the British Association as a physical observatory in 1841, and given its present name. In 1871 it was placed under the control of the Royal Society.

Kewanee, kẹ-wä'nē, Ill., city in Henry County; on the Chicago, B. & Q. railroad; about 100 miles north by west of Springfield and 122 miles southwest of Chicago. It is situated in an agricultural region, and coal-fields are in the vicinity. The chief manufactures are agricultural implements, boilers, pumps, steam-heating machinery, gloves, mittens, and carriages and wagons. The tube and boiler works employ about 3,520 men. The public library has about 10,000 volumes. The city owns and operates the waterworks. Pop. (1890) 4,569; (1900) 8,382.

Kewa'tin. See KEEWATIN.

Kewaunee, kẹ-wâ'nē, Wis., city, county-seat of Kewaunee County; on Lake Michigan at the mouth of the Kewaunee River, and on the Kewaunee, G. B. & W. railroad. The first permanent settlement was made in 1850, and the city received its charter in 1882. Its chief industrial establishments are foundries, machine-shops, pea-canning works and coffin factory. Pop. (1900) 1,773.

Keweenaw (kē'wẹ-nâ) **Bay,** an arm of Lake Superior, north of Michigan. It is 8 miles long, by 2 to 6 miles in length. The town of Baraga lies at the head of the bay.

Keweenaw Point, a peninsula in northern Michigan, projecting into Lake Superior. It is rich in copper mines, the maximum thickness of the strata here being 40,000 feet. The peninsula is as large as the State of Delaware, and includes Houghton and Keweenaw counties. Among the towns on the peninsula are Calumet, Houghton, Eagle Harbor, and Copper Harbor.

Keweenawan (kē'wẹ-nâ-ạn) **Series,** a great series of rocks, believed to be of Pre-Cambrian age, typically developed on Keweenaw Point, Mich., but found over a large area in Michigan, Wisconsin, and Minnesota. Rocks of the same age occur also in Canada, and possibly in the Adirondack Mountains in New York. The series on Keweenaw Point and southward has a maximum thickness of perhaps 50,000 feet; the lower part consists mostly of thick sheets of lava and intrusive rocks with some sandstone and conglomerate; the upper part is a mass of sedimentary rocks. In the series occur the famous Lake Superior copper deposits. The Keweenawan series is included in the Algonkian or Eozoic system.

Key, David McKendree, American jurist and cabinet officer: b. Greene County, Tenn., 1824; d. Chattanooga, Tenn., 3 Feb. 1900. After studying law he was admitted to the bar in 1849, and in 1853 took up his residence in Tennessee, establishing a successful law practice at Chattanooga. After vainly attempting to prevent the secession of Tennessee, when once that step was taken he joined the Confederate army and served through the War, but at its close joined the Republican party, succeeded Andrew Johnson in the United States Senate (1875); in 1877 was made postmaster-general; and in 1880 was appointed United States district judge for the Eastern and Middle Districts of Tennessee, a position he held till his death.

Key, Francis Scott, American lawyer and song writer: b. Frederick County, Md., 1 Aug. 1779; d. Baltimore 11 Jan. 1843. He was educated at St. John's College, Annapolis, and commenced the practice of the law in Frederic City. Subsequently he removed to Washington, where he was for many years district attorney of the District of Columbia. As a song writer he is chiefly known by his ‹Star-Spangled Banner,› a popular national lyric, suggested and partially written while the author was detained in the British fleet during the bombardment of Fort McHenry, near Baltimore, of which he was an anxious and interested witness. A posthumous collection of his miscellaneous poems was published in 1856.

Key, in music: (1) A mechanical contrivance for closing or opening ventages, as in flutes, clarinets, ophicleides, etc. By means of keys on such instruments, apertures too remote to be reached by the outstretched fingers are brought under control of the player. (2) A lever which brings the pallets of an organ under the control of the hand or foot of an organist. (3) A lever which controls the striking apparatus of a key-stringed instrument. In the harpsichord it acted on the jack; in the pianoforte it acts on the hammer. (4) The wrest or key used for tuning instruments having metal pegs. Its end is hollowed out so as to fit over the four-sided end of the peg, and the cross-bar with which it is surmounted gives leverage to the hand of the tuner, so that he is enabled to tighten or loosen a string, or (in the case of a drum) slacken or strain a parchment. (5) The sign placed at the commencement of the musical stave which shows the pitch of the notes, was originally called a clavis or key. This sign is called in modern music a clef. (6) Key, in its modern sense, is the starting point of the definite series of sounds which form the recognized scale. Different starting points require the relative proportion of the steps of the scale to be maintained by means of sharps or flats in the signature. The key of C major requires no flats or sharps for this purpose, hence it is called the normal key.

Also a metallic instrument for shooting the lock-bolt of a door; an instrument formed with cavities or interstices corresponding to the wards of a lock, by which the bolt is moved backward or forward.

Key West, Fla., city, port of entry, county-seat of Monroe County; about 60 miles southwest of Cape Sable and nearly 100 miles north by east of Havana, Cuba. The city is on Key West Island, one of a group of coral islands, called Florida Keys. It is the farthest south of any city in the United States. The first permanent settlement was made in 1822 and the city received its charter in 1832. Key West Island is covered by only a thin layer of soil upon which vegetation grows luxuriantly. The island averages about 11 feet above the sea. The harbor is excellent; at the main entrance, on an artificial island, is located Fort Taylor. The city has regular steamer communication with the large cities on the Atlantic and Gulf coasts and with the West Indies and Central America. It is a United States naval station, and during the war with Spain, it was the rendezvous of the United States navy. The chief industries are manufacturing of cigars, gathering sponges, and fishing. There is a large trade in fish, fruit, vegetables, turtles, turtle-shell ornaments, salt, tobacco, both raw and manufactured. In connection with the naval station there are barracks, machine-shops, marine hospital, docks, etc. Some of the chief public buildings are the government buildings, post-office and custom-house, county court-house, city-hall, and the Martello towers. The principal educational institutions are a Methodist Seminary and the Holy Name Academy. The convent of the Holy Name was used as a hospital for soldiers during the Spanish war. The free public library and the public and parish schools are excellent. There are two banks with a combined capital of $150,000. The government has erected two light-houses in the harbor and others among the islands; but still many wrecks occur each year. The city owns and operates the waterworks. Pop. (1900) 17,114.

Keyes, kēz, **Edward Laurence,** American surgeon: b. Charleston, S. C., 28 Aug. 1843. He is a son of Erasmus Keyes (q.v.) and was graduated from Yale in 1863 and from the medical department of the University of New York in 1866. He has practised his profession in New York from 1867, and is now (1903) consulting surgeon to Bellevue Hospital. He has published: ‘The Venereal Diseases’ (1880); ‘Treatise on Surgical Diseases of the Genito-Urinary Organs’ (1881); etc.

Keyes, Emerson Willard, American educator and financial writer: b. Jamestown, N. Y., 30 June 1828; d. 13 Oct. 1897. He graduated from the State Normal School, was deputy superintendent of public instruction in New York 1857–65, and acting superintendent 1861–2. In the latter year he was admitted to the bar, became deputy superintendent of the banking department of New York State in 1865, and was appointed bank examiner five years later. In 1882 he was appointed chief clerk of the Brooklyn (N. Y.) Board of Education, a position which he filled until his death. He published: ‘New York Court of Appeals Reports’ (1867–9); ‘History of Savings Banks in the United States’ (1878); ‘New York Code of Public Instruction’ (1879); etc.

Keyes, Erasmus Darwin, American general: b. Brimfield, Mass., 29 May 1810; d. Nice, France, 11 Oct. 1895. He was graduated from West Point in 1832, and served in Charleston in 1832–3. He was later placed on frontier duty in the Northwest during the Civil War, and won distinction at Fair Oaks and elsewhere. He was promoted major-general of volunteers 5 May 1862, and on 31 May of that year was brevetted brigadier-general United States army. He resigned in 1864 and settled in California. He published ‘Fifty Years’ Observation of Men and Events’ (1884).

Keyes, the name given to coral and other reefs or slightly sunken rocks off the shores of Florida, Central America and the West India Islands. The term is derived from the Spanish *cayo* (an islet, rock).

Keyser, kī'zėr, **Ephraim,** American sculptor: b. Baltimore, Md., 6 Oct. 1850. On the completion of his academic course in his native city, he studied art at the Royal Academies in Munich and Berlin, where his success was marked. He has had studios in Rome, Italy, New York, and Baltimore, where he now resides, in charge of the sculpture and modeling classes at the Maryland Institute School of Art. His most important public works are the De Kalb statue at Annapolis, Md., and President Arthur's tomb at the Rural Cemetery, Albany, N. Y. He has made numerous portrait busts, among others those of Cardinal Gibbons, Daniel Coit Gilman, and Sidney Lanier. While abroad he received the Michael Beer scholarship.

Keyser, Leander Sylvester, American Lutheran clergyman and ornithologist: b. Tuscarawas County, Ohio, 13 March 1856. After graduation from Wittenberg Divinity School he filled various Lutheran pastorates in Indiana and Ohio, and has been pastor of Midland College Church, Atchison, Kan., from 1897. He has published: ‘The Only Way Out’ (1888); ‘Birddom’ (1892); ‘In Bird Land’ (1894); ‘Birds of the Rockies’ (1902).

Keystone State, a name given to Pennsylvania, because it was the seventh, or central of the original 13 States.

Khaki, kä'kĭ, a kind of light-brown, drab, or dust-colored cloth, originally used for making the uniforms of East Indian regiments. In the South African war of 1899–1901 the British troops wore khaki uniforms for purposes of protective coloration, and khaki was also worn by the United States troops in the Spanish-American war.

Khalifa, kä-lē'fä, **The** (Sayed Abdullah Ibu-Sayed Mohammed), Arab religious leader: b. Darfur 1846; d. battle of Om-Debrihat, Egypt, November, 1899. He fought against the Egyptian invasion of Darfur, and subsequently, having heard of the troubles of the Mad Mullah (q.v.), Mohammed Ahmed, with the Egyptian authorities, he visited Mohammed, and proclaimed that the latter was the divinely-sent Mahdi, or «director,» appointed for the regeneration of Islam. It was by his councils that the Mahdi caused the troubles in Kordofan and Darfur. Ere long he was made «khalifa,» or vice-gerent, his acts to be regarded as equivalent to the Mahdi's own. He was named by the Mahdi as successor, and from 1885 ruled over the Sudan and such adjacent districts as he brought within his sway. His capital was situated at Omdurman, near which, on 2 Sept. 1898, his army, though fighting with great bravery, was almost annihilated by the British and Egyptian forces under Sir Horatio (now Lord) Kitchener (q.v.). He escaped northward, but in November 1899 was slain at the combat of Om Debrihat. See also Egypt — *History;* Sudan.

Khammurabi. See Hammurabi, The Code of.

Khan, kän or kăn, or **Caravansary,** in Turkey and other Eastern countries. There are two kinds, those for poor travelers and pilgrims, where a lodging is furnished gratis; and those for traders, which are usually more convenient, a small charge being made for each chamber.

Khandesh, khän-dēsh', or **Candeish,** British India, an inland district in the presidency of Bombay, with an area of 10,907 square miles. The chief town is Dhulia (pop. 21,880). Pop. 1,460,851.

Khargeh, khär'gē, or **Kharga,** Egypt, town, in the oasis of the same name; 100 miles west of Thebes. Here are the ruins of the temple of Ammon. Pop. 4,000.

Kharkov, ʜär-kŏf′, or **Charkov,** Russia, (1) a southern government bounded north by Kursk and Voronezh; west and southwest by Poltava; south by Ekaterinoslav; east by the Don Cossacks; area, 21,041 square miles. There are forests in a few parts, but the country generally is open, the soil dry and of a mixed loamy and sandy nature, but usually fertile. The climate is mild, though the winter is somewhat severe; the summer is frequently very hot. Agriculture and the rearing of sheep and other domestic animals form the chief employment of the inhabitants. Sugar and tobacco are manufactured. Pop. (1897) 2,509,811. The principal town is (2) Kharkov, the capital, at the confluence of the Kharkovka and Lopanj, 400 miles southwest of Moscow. The houses are mostly of wood, whitewashed, and have a cleanly appearance. The city is the see of an archbishop, contains a cathedral and other churches, a university with a library, a museum and botanical garden, a technological institute and a veterinary institute, several gymnasia, two theatres, etc. The inhabitants carry on a considerable trade in soap, candles, and leather; and among the chief industries are wool-washing and the manufacture of tobacco and cigars. Pop. (1897) 174,841.

Khartum, ʜar-toom′, or **Khartoum,** capital of the Egyptian Sudan, on the left bank of the Blue Nile, near its junction with the White Nile. Founded under Mehemet Ali in 1823, it rapidly rose to be the chief town of the Egyptian Sudan, but after its conquest by the Mahdi it was abandoned for Omdurman, on the opposite bank of the river. In the latter part of 1898 it was again occupied by British and Egyptian troops, who found it in a ruined and neglected condition. It is a straggling place covering a wide area, with irregular streets, and houses mostly built of sun-dried bricks. The situation of Khartum made it the emporium of a large trade in ivory, gums, ostrich feathers, senna, etc., which is again developing under Anglo-Egyptian rule. It was the scene of Gordon's heroic defense against the insurgent Sudanese, and of his death in January 1885. The Gordon College, established here after the British occupation, was named in honor of him. Pop. 40,000.

Khayyám, Omar, ō′mär khī-yäm′. See Omar Khayyám.

Khedive, kĕ-dēv′ (*Khidîv*), a Persian word signifying lord, the title of the Pasha of Egypt, granted him by a firman from the sultan in 1866. In Persia it was at different eras adopted by provincial governors who were independent of the shah. The title, which had fallen into disuse both among Persian and Turkish governors, was revived in order to give additional honor to Ismail Pasha.

Khiva, ʜē′vä, or **Chiva,** a vassal state of Russia, in Central Asia. It formerly occupied a large extent of surface on both sides of the Amu-Daria or Oxus, but since the cession to Russia, in 1873, of its territory on the east of the Amu, is now confined to the west side of this river. It is of a triangular shape, each of its three sides — of which Amu forms one — being about 300 miles in length. One of its angles rests on the Sea of Aral. A great part of the surface consists of deserts, thinly inhabited or uninhabitable; but along the Amu the land is of a very different character, consisting of rich alluvial loam of the greatest natural fertility. Owing to the great dryness of the atmosphere, however, it soon becomes so stiff and hard that it cannot be penetrated by any ordinary implement. For this the obvious remedy is irrigation; and accordingly, from the earliest period, a mode of culture resembling that of Egypt has been practised. Large canals from the river, with numerous minor branches, intersect every part of the surface, supplying moisture where it is wanted, or removing it where it is in excess, and securing the most luxuriant crops of wheat, maize, rice, barley, and legumes. Cotton and madder are also generally cultivated. The vine thrives well, but requires to be defended against the winter cold by a covering of straw and earth; all the ordinary fruits, including apples, plums, cherries, apricots, figs, and pomegranates, are common. Trade is carried on chiefly with Russia. The principal exports are raw and spun cotton, in return for which are received various articles of European manufacture, as metals and ironware, woolen, cotton, and silk goods, etc. From Bokhara also are obtained cotton and silk goods, green tea, raw tobacco, Chinese porcelain, etc. These are sometimes paid for in money, but more frequently in Russian wares. The government of Khiva is an unmitigated despotism. The greater part of the inhabitants are Tajiks and Uzbeks, in nearly equal numbers. After these are Persians, Karakalpaks, Jamshids, and Turcomans. The designs of Russia on Khiva long caused disquietude in Britain, which has always been jealous of Russian advances in Asia, mainly from a dread of interference with her Indian empire. Accordingly Count Schouvaloff was despatched to England in January 1873, to give explanations respecting an intended expedition to Khiva. Its object was represented as simply the suppression of brigandage, the recovery of a few Russian prisoners, and to teach the khan to desist from acts of violence in the future. The emperor, it was said, had given positive instructions that Khiva should not be taken possession of. In spite of these protestations, however, Khiva was taken possession of on 10 June; and later in the year, though the nominal independence of the khan was stipulated for, it was decided to annex to the Russian dominions the Khivan territory on the right bank of the Amu. The khan also renounced all right of making wars or treaties without Russian sanction. The population is estimated at 700,000 to 1,000,000.

Khokand, ʜō-känd′. See Ferganah.

Khoozistan′. See Elam.

Khorasan, ʜo-rä-sän′, Persia, an extensive northeastern province; area, about 140,000 square miles. The surface is to a great extent uninhabitable. The mountainous region of the north has many well watered valleys with a fertile soil. The most valuable mineral is the turquoise. In many parts cotton, hemp, and tobacco grow freely, and aromatic plants and drugs are numerous and valuable. The principal manufactures are silk and woolen stuffs, carpets, firearms, and sword-blades. About two thirds of the inhabitants are Persians; the remainder are Turcomans, Kurds, and other tribes, who lead a nomadic life. The chief town is Meshed. Pop. estimated at 860,000.

Khorsabad, khŏr-sä-băd'. See NINEVEH.

Khyber (HI'bėr) or **Khaibar Pass,** a mountain pass on the frontiers of India and Afghanistan, leading from Punjab to Jelalabad and Cabul. The pass winds northwest through a range of hills, called by the same name, for a distance of about 33 miles, and forms the bed of two streams, the one flowing northwest, the other south-southeast. It is at one part as narrow as 10 feet in width, and in many places the hills on either side are quite precipitous and inaccessible, rising at one point to the height of 1,300 feet. At 9½ miles distance from the Indian entrance of the pass is the fort of Ali Masjid, which has several times been taken by the British from the Afghans. The highest point of the pass is Lundi Kotal, 3,373 feet above sea-level. The pass forms the northern military route from India to Afghanistan, and is now under British control.

Kiang, kē-äng', **Dziggetai** or **Kulan,** the large wild ass (q.v.) of Tibet and Mongolia, characterized by its large size (11 to 12 hands high), dark reddish color and the narrowness of the black stripe along the spine; some have faintly barred legs. They dwell upon the lofty, sterile plateaus north of the Himalayas, moving about in bands which travel at amazing speed over the stony plains and up and down the steep hillsides, feeding mainly on twigs of woody desert plants, and acquiring great hardiness. They are hunted by the Mongols as game, yet are not shy as a rule, coming close to a traveling party or camp, apparently actuated by extreme curiosity, unless driven away. The voice has been described as like the neigh of a horse; but the general and truer opinion is that it is more nearly the shrieking bray of the ass. The animal is nowhere domesticated, except a few captive specimens in zoological gardens. See ONAGER.

Kiang-Si, kē-äng'sē, or **Kiangse,** one of the 18 provinces of China proper. It is bounded on the north by Hupeh and Ngan-Hui, on the east by Che-Kiang and Fu-Kien, on the south by Kwang-Tung, and on the west by Kwang-Si and Hunan. The area is 72,176 square miles. The province contains the treaty port of Kiu-Kiang on the Yang-tse-Kiang. The Nan-Ling or Southern Mountains traverse the eastern half of Kiang-Si, and in the north is the large inland lake of Po-Yang-Hu. Here are established famous manufactories of porcelain. The principal river aside from the Yang-tse-Kiang, is the Kin-Kiang. The province produces tea and silk, besides porcelain. The English have large railway concessions. There are telegraph lines connecting the treaty port with other centres of commerce.

Kiang-Su, kē-äng'soo, an important maritime province of China proper, bounded north by the province of Shan-Tung; east by the Yellow Sea; south by the province of Che-Kiang, and west by the provinces of Ngan-Hui and Ho-Nan. Kiang-Su has an area of 44,500 square miles (about that of Pennsylvania). The great commercial importance of this province is denoted by its possession of four treaty ports, Shanghai, Nankin, Su-Chau and Chin-Kiang. Kiang-Su was in fact the first province opened to foreign commerce by means of a treaty port. It is traversed almost its whole length by the Grand Canal, the ancient Chinese system of waterways. The British have valuable railway concessions and the Germans claim mining rights here. Half the foreign population of China is established in this province.

The Yang-tse-Kiang empties into the sea through this province and enables it to control the trade of all southern China. There are large cotton mills. The capital of the province is Nankin, which was formerly the capital of the Chinese empire. The Tai-Ping rebellion of 1853-4 had its headquarters in this province. Kiang-Su is rapidly becoming the centre of Chinese manufacturing industries, especially in textiles. Commercially, the province is controlled by the English, who have invested largely in railways, mills, and government concessions. Pop. (1900) estimated, 28,000,000.

Kianganes, a Philippine tribe. See QUIANGANES.

Kiao-Chau, kē-ä-ō-chow', or **Kiao-Chow,** a Chinese walled city and a protectorate of the German empire, around the shores of Kiao-Chau Bay on the east coast of the province of Shan-tung. The bay is some 15 miles across from east to west and north to south, and has deep-water anchorages suitable for foreign vessels in its southeastern portion. Kiao-Chau was seized by Germany in November 1897, and in March 1898 the town, harbor, and district were transferred to Germany by treaty on a lease for 99 years, the territory, which covers about 200 square miles, being then declared a protectorate of the German empire. It comprises 33 townships, with a population of 60,000. Around the leased territory is a neutral zone of 2,500 square miles in area. The protectorate is administered by the navy department, its governor being a naval officer. The German garrison, about 2,400 strong, consists of marines and marine artillery.

Kibit'ka, a carriage without springs used in Russia; also the name of a tent used by the nomad tribes of Kirghiz Tartars.

Kick'apoos, a tribe of Algonquian Indians, formerly occupying a portion of the Ohio Valley. They were a powerful nation in the early history of that region, and were constantly in arms against the whites until in 1819 they concluded the sale of most of their lands and removed to the Osage River Reservation in Kansas. In 1852 a considerable number of them went to Texas and from there to Mexico; some of these returned, however, and settled in the Indian Territory. In 1900 the total number of Kickapoos in the United States and Mexico was estimated at 1,000. See INDIANS.

Kidd, Benjamin, English sociologist: b. 9 Sept. 1858. He entered the inland revenue service of Great Britain in 1877 and rose to sudden fame by the publication of 'Social Evolution' in 1894. The volume was translated into most of the languages of Europe, and gave rise to considerable controversy, President Roosevelt publishing a series of papers in opposition of the views propounded in it. Its main proposition was that high moral and religious development in society was a process that ran exactly contrary to natural evolution and the Darwinian process of survival. He has also published: 'The Control of the Tropics' (1898); and 'Principles of Western Civilization' (1902).

Kidd, William, American pirate: b. probably Greenock, Scotland, about the middle of the 17th century, executed London 24 May 1701. He appears to have followed the sea from his youth, and about 1695 was known as one of the boldest and most successful shipmasters that sailed from New York. At this time the depredations of pirates upon British commerce had become so extensive that a company was organized in England, in which William III. and several noblemen were shareholders, to fit out an armed vessel for the purpose of suppressing the practice, as well as of deriving a profit from recaptures. Kidd, who had obtained some experience as captain of a privateer against the French, received a commission signed by the king, and directed to «the trusty and well beloved Captain Kidd, commander of the ship Adventure Galley,» a vessel of 30 guns. Sailing from Plymouth, England, in April 1696, he cruised off the American coast for some months, occasionally entering New York, and finally sailed for the East Indies and the east coast of Africa. Upon his way he resolved to turn pirate, and finding his crew not averse to the project, forthwith commenced a career of plunder and outrage among the shipping which frequented the coasts of Malabar and Madagascar, returning in 1698 with a large store of booty to New York. He took the precaution to bury a portion of his treasure on Gardiner's Island at the east end of Long Island, and subsequently went to Boston, where he boldly made his appearance in the streets, not doubting that under his commission he could clear himself from any charge of piracy. Such, however, had been the scandal which the report of Kidd's depredations had caused in England, that the Earl of Bellamont, governor of Massachusetts and New York, and one of the shareholders in the enterprise, caused him promptly to be arrested and conveyed to England for trial. The charge of piracy was difficult to prove; but having been arraigned for killing one of his crew, named Moore, in an altercation, he was convicted after a grossly unfair trial, and hanged at Execution dock. His name and deeds have been interwoven into popular romance, and form the subject of the well-known ballad commencing: «My name is Captain Kidd, as I sailed, as I sailed,» many of the incidents of which, however, are apocryphal. The treasures he had left, consisting of 738 ounces of gold, 847 ounces of silver, and several bags of silver ornaments and precious stones, were secured by Bellamont. But according to popular belief this inconsiderable amount constituted but a tithe of all he had collected, and down to the present time the shores of Long Island Sound and various parts of the banks of the Hudson River continue occasionally to be explored in the hope of discovering the abandoned wealth of the great pirate.

Kid'der, Frank Eugene, American architect: b. Bangor, Maine, 3 Nov. 1859. He was graduated from the University of Maine in 1819, studied at the Massachusetts Institute of Technology 1880–1, and has published ‹Architects' and Builders' Pocket Book› (1885); ‹History of the Kidder Family› (1886); ‹Churches and Chapels› (1895); ‹Building Construction and Superintendence› (1896).

Kidder, Frederic, American historical writer: b. New Ipswich, N. H., 1804; d. Melrose, Mass., 1885. He gave much attention to the language and religion of the New England Indians, and published ‹The Expeditions of Capt. John Lovewell› (1865); ‹History of the First New Hampshire Regiment in the War of the Revolution› (1868); ‹History of the Boston Massacre› (1870); etc.

Kid'derminster Carpet, so called from being made in the town of that name in England. Another of its names, ingrain, signifies that it is made of wool or worsted dyed in the grain; that is, before manufacture. Its names two-ply or three-ply indicate the number of webs which go to the making of the fabric.

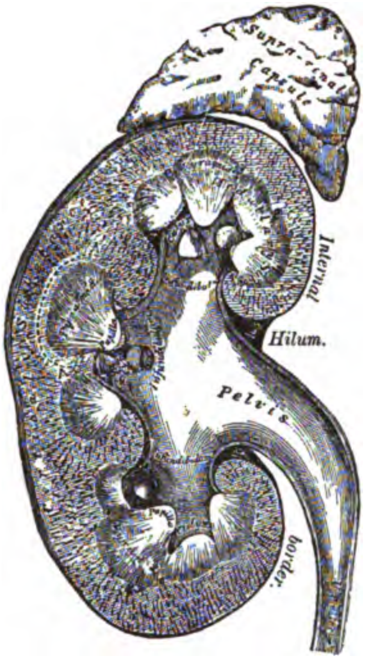
Kidnapped, a romance by Robert Louis Stevenson, published in 1886, when the author was 36. In his own opinion, it was his best novel; and it is generally regarded as one of his finest performances in romantic story-telling. The full title reads: ‹Kidnapped: Being Memoirs of the Adventures of David Balfour in the Year 1751›; and the contents of the tale are further indicated on the title-page, thus: «How he was Kidnapped and Cast away; his Sufferings in a Desert Isle; his Journey in the Wild Highlands; his acquaintance with Alan Breck Stewart and other notorious Highland Jacobites; with all that he Suffered at the hands of his Uncle, Ebenezer Balfour of Shaws, falsely so called.»

Kid'napping, is not a legal term, but is frequently applied as such in popular language, both in Great Britain and the United States, to the offense of stealing or carrying off by force a child or adult. In its more limited sense, it is applied to the obtaining of slaves or native labor by force, as practised by the Arabs in Africa. This barbarous traffic existed in very recent years in the South Seas, carried on by Europeans, but now happily suppressed by the appointment of government labor agents. In Great Britain this term was formerly also applied to the illegitimate recruiting for the army and navy. See ABDUCTION.

Kid'ney Bean, a bean of the genus *Phaseolus*, of which European species and varieties have been cultivated from a time immemorial (see BEAN). The wild kidney bean of the United States is a high-climbing vine (*P. perennis*), bearing small purple flowers. The so-called «kidney-bean tree» is *wistaria* (q.v.)

Kidney-root, the purple boneset (q.v.).

Kidneys, the principal excreting organs of the body. They are two in number, fixed in position at the back of the abdominal cavity by a thick layer of fat and the peritoneum which passes in front of them; their lower border is slightly below the last ribs; their shape is characteristic; they have an outer, upper, and lower convex margin, and an inner margin deeply indented, allowing the entrance of the renal artery and exit for the veins and ureter. This indentation corresponds to a considerable hollowing of the interior, which is occupied by the funnel-like origin of the ureter (the pelvis). The kidney is surrounded by a firm membrane called the capsule; inside of this is the substance proper, made up of a connective-tissue groundwork in which are embedded the blood-vessels and the secreting glands called the uriniferous tubules. These tubules start in tiny rounded bodies (Malpighian bodies), and after an orderly arrangement of windings a number of the tubules form slightly larger tubules (collecting tubules), so grouped together as to form striated pyramids which have their apices projecting into the pelvis of the kidney. A Malpighian body is made up of a tuft of blood-vessels, a glomerulus, surrounded by a dilated end of the tube (capsule of Bowman), so that the endothelial lining of the capillary and the epithelium of the end of the tubule are in apposition. By a process similar to filtration the excess of water in the blood passes through these walls and out of the body. There is a similar arrangement of the blood-vessels around the winding tubules, but through these the solids in solution in the blood that are of no further use to the body are taken up by the epithelium of the tubules and added to the watery element inside the tubes. This mixed fluid, called the urine, is then passed out into the ureter, whence it is conveyed to the bladder and stored until passed. The ureters are about 16 inches long, with the diameter of a goose-quill; they are lined by a mucous membrane, outside of which there are thin muscular and fibrous layers of tissue.



Vertical Section of Kidney.

Urine.— The urine is an amber or yellowish fluid containing about 95 per cent of water, having a specific gravity of 1.018 to 1.025, an acid reaction, and rather characteristic ammoniacal odor. The inorganic solids held in solution are the chlorides, phosphates, and sulphates of sodium, magnesium, potassium, calcium, and iron. More important than these is a group of substances elaborated in the body during metabolism (q.v.), some of which may act as poisons if not properly discharged; the principal ones being urea, uric acid, creatinine, hippuric acid, and the xanthin bases. That of most importance is urea, which should in normal adults be excreted to the amount of 500 grains daily. In kidney disease the deficiency of this substance is taken as an index of the organ's impairment.

Visible Abnormalities of the Urine.— While the average amount of urine passed by a healthy adult in 24 hours is 50 ounces (3 pints), there are constant variations from this rule, depending on the amount of water ingested and the amount lost through the skin and bowels: so also do the amount of solids vary with the diet and amount of exertion. White cloudiness of the urine may be caused by the presence of pus, phosphates, mucus, or bacterial growths. Reddish or “brick-dust” deposit is caused by an excess of urates, a condition ordinarily of no importance and never an indication of kidney disease. There is apt to be a diminution of the amount of urine in nephritis, and a great increase in diabetes.

Albumen in the urine is the serum albumen of the blood. In health the kidneys may allow the passage of faint traces of this substance, but the presence of amounts large enough to be discovered by the “heat and nitric acid” test usually indicates some abnormality of the epithelium of the tubules — congestion of these organs, inflammation of the ureter, bladder, or urethra, or an admixture of blood with the urine. Albumen may appear in the urine after severe exertion without apparent congestion of the kidneys. Certain individuals go on for years showing albumen in the urine at certain times of the day and never develop any further evidence of Bright's disease. In some persons certain articles of food, particularly those rich in albumen, cause a temporary albuminuria. Although these forms are called “functional,” there is always a possibility that they may indicate some slight kidney impairment, and it is the custom of the insurance companies to refuse applicants with albuminous urine.

Urinary casts are tiny cylinders or plugs formed in the uriniferous tubules under abnormal conditions. They are formed of coagulated albumen blood and epithelial cells, granular matter the result of epithelial cell degeneration, and so-called waxy matter. The clear “hyaline casts” may sometimes be found in small numbers in the urine from normal kidneys, but the constant presence of casts indicates a disease of the kidneys. These bodies are entirely invisible to the naked eye.

Uræmia.— This term denotes a group of symptoms that may appear in the course of diseases of the kidneys and during pregnancy. (See Puerperal Eclampsia.) Some toxic substance is held in the blood and causes one or more of such symptoms, which may not be characteristic of uræmia but to which, because of the general complex of symptoms and the known condition of the urine, the term uræmic is applied. The various symptoms which it is customary to include in the category are headache and sleeplessness, hemiplegia and aphasia, general convulsions and spasms of groups of muscles, blindness, delirium and coma, vomiting, dyspnœa, and increased arterial tension. This last condition is due to spasm of the smaller arteries and to hypertrophy of the heart.

Diseases of the Kidneys.— Acute congestion may result from sudden obstruction of the veins, certain irritant poisons, exposure to cold, severe surgical operations, overexertion, or from the infectious diseases. Besides the changes seen in the urine, albuminuria and casts, if the congestion be severe there may be fever, abdominal pain, nausea and vomiting, and partial or complete suppression of urine. The treatment consists in the removal of the cause and the relief of congestion by the hot pack over the lower half of the body. In its severe forms the conditions may be fatal.

Chronic Congestion.— This condition results from obstruction to the venous outflow, as seen in disease of the lungs, heart, and liver, and from the pressure of tumors: it leads to actual change of structure.

Acute Nephritis, Acute Bright's Disease.— This is an inflammation of the vital part of the kidney structure, the secreting membrane of the uriniferous tubules and of the structures around them. In such an inflammation there is congestion of the whole organ, degeneration of the epithelial lining of the tubes, exudation of serum from the blood-vessels into the tubes, and consequent disturbance of the function of the organ. The most common causes of this condition are exposure to cold and wet, the poisons of scarlet fever, pregnancy, etc., certain causes being undiscoverable. The condition may also be due to other infectious diseases, to the ingestion of poisons, or to the presence of large burns of the body surface.

Some cases are so mild that the kidneys are not suspected, the patient having a slight fever, headache, loss of appetite, and general malaise. The ordinary cases show considerable diminution of urine, which is loaded with albumen and casts; there is considerable fever; nausea and vomiting are usual; and these are accompanied by more or less of dropsy, headache, and the other manifestations referred to under the name of uræmia, and by a rapidly developing waxy pallor. These various symptoms are not constant, but the picture is sufficient when the condition of the urine is investigated. As a rule, when this condition lasts only a few weeks these cases recover completely, and the kidneys are as good as before, but the cases of longer duration and of great severity may be fatal, or may leave permanent changes in the organ. This last effect is particularly liable to follow when nephritis begins late in the course of scarlet fever, because of the permanent changes of structure induced by some particular poison generated at that time.

The treatment of these conditions consists in absolute rest, diet of the simplest sort, preferably milk, opening of the various emunctories (the bowels and skin), and attending to such symptoms as threaten the life of the patient.

Chronic Bright's, Chronic Nephritis.— This disorder is characterized by a permanent change in the tissue of the kidney, which may follow acute inflammation, or may come on insidiously as a result of poisoning by alcohol, of syphilis, of prolonged nervous strain, with consequent disturbance of digestion and metabolism, of suppurative inflammations in other parts of the body, and of many undiscoverable causes. The changes in the kidneys consist in growth of connective tissue around the glomeruli and tubules, more or less degeneration of the epithelium lining the tubes, and arteritis. The disease may be very insidious in development, albumen and casts being discovered on routine examination of the urine. Loss of nutrition may be noticed, or a disturbance of the gastro-intestinal tract may first call attention to the disease. The urine may be increased in amount or diminished, but as the disease progresses the specific gravity grows less from the decrease of urea. Dropsy appears around the ankles and spreads usually as the disease advances. Anæmia is fairly constant, but not severe. Sooner or later that general condition of poisoning known as uræmia is apt to develop because of the inability of the kidneys to excrete the toxic substances. Some cases suddenly develop one or more of the various symptoms, either dyspnœa, dropsy, failure of the hearts' action, coma, convulsions, or hemiplegia, without the nephritis having occasioned distinct symptoms previously.

Prognosis in Chronic Nephritis.— The prognosis is not necessarily bad, although as a rule the disease progresses and causes the death of the patient. Intercurrent diseases throw extra strain on the kidneys, and may hasten a fatal termination. Many cases live for years in comparative health, and are carried off by another affection. The actual prognosis of a case is determined by the work the kidneys are able to do on a known diet and under stated conditions of work. This is best determined by an estimation of the excretion of urea in a 24-hour collection of urine.

Treatment.— No treatment of the disease, so far as cure is concerned, is possible, but the progress of the affection can be stayed and the patient kept in comparative good health by careful attention to mode of life, diet, and regulation of the bodily functions. At the time of the more acute exacerbations symptoms are relieved as they arise, and the skin and bowels are called upon to assist the kidneys in the work of excretion by diaphoresis (by the hot pack) and catharsis. When the output of urine becomes small, some benefit may result from the administration of diuretics. For the disturbance of the circulation arterial dilators and cardiac stimulants are employed, and sometimes bloodletting, with the greatest benefits.

Renal Calculi or Kidney-Stones.— See CALCULUS.

Tuberculosis of the Kidney.— This malady occurs in the form of tiny miliary tubercles scattered through the kidney, usually as a part of a general tuberculosis, and in the form of a tubercular pyonephrosis due to extension from the bladder; more rarely the process may be primary in the kidney and then extend to the bladder. The symptoms are frequent micturition, pyuria, hematuria, and occasionally the presence of a tumor. The diagnosis is difficult unless there be tuberculosis of the bladder, testes, or seminal vesicles. Although the prognosis is always grave, cases have recovered where the kidney has been inspected but not removed. Nephrectomy is not performed unless the other kidney can be proven sound.

Injuries of the Kidney.— Severe contusions of the abdomen or loins may cause laceration of the kidney substance and the capsule, or the kidney may be perforated by stab or gunshot wounds. Slight contusions cause pain and transient hematuria, but the more severe contusions and wounds allow the urine to flow out into the surrounding tissue, sometimes with inflammation following. The wound may require sutures, or the kidney may have to be removed.

Suppuration in and around the Kidney.— This condition is due to the infection of the part with micro-organisms, which may reach the part in three ways — through the blood, from the bladder, and through perforating wounds. It is now commonly noticed that persons in health may pass bacteria through their kidneys without resulting suppuration; and it seems that some injury must take place to allow them to grow there and cause actual damage. Such damage may be made by calculi or contusions. Pylitis is an inflammation of the pelvis of the kidney, and this part is first involved when the inflammation travels up from the bladder. Pyelonephritis is an inflammation of both pelvis and kidney structure. Pyonephrosis is the name used to describe the condition of dilatation of the pelvis and the kidneys with pus: the organ may be entirely destroyed. Perinephritis is an inflammation of the cellular tissue and fat around the kidney. In pyæmia there may be many small abscesses in the kidney substance.

The symptoms of these various forms depend on the severity and site of the inflammation: there are the changes in the urine (the presence of pus, blood, and epithelium from the various parts), the local signs (pain, and possibly swelling), and the general signs of poisoning (fever, rigors, septic look, nausea, vomiting, etc.). An abscess in the kidney may burrow through to the surface; it may drain sufficiently through the normal channels and become chronic; or the patient may die of acute sepsis.

In the treatment of the milder forms it may be sufficient to remove the cause; the bladder may be cleansed by irrigation; or if a penetrating wound be the cause it may be enlarged and cleansed. If there be a perinephritis or a severe pyelonephritis, the abscess-cavity must be drained. The kidney is removed (nephrectomy) if destruction has gone too far.

Movable or Floating Kidneys.— By this phrase is meant a condition in which the kidneys leave their fatty bed and travel downward or otherwise through the abdomen. In the milder grades of this condition the kidney is displaced downward during inspiration, but in the more severe grades one or both are constantly low, even down to the pelvis. No symptoms whatever may arise from this condition; but on the other hand the dragging on the vessels and nerves may give rise to pain in the back and sides, minor disturbances of digestion, or nausea and vomiting. The nervous system is so deranged that it is common to have most confusing symptoms. Occasionally the ureter becomes twisted and dams back the urine, causing marked distention of the pelvis of that organ, a condition called hydronephrosis. When such an obstruction persists, the kidney structure is gradually thinned until its function is lost. It is customary to have the sufferer from a floating kidney wear a support around the abdomen; at times the operation of fixation of the kidney in its normal place may be advisable.

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Kieffer, kēf'ėr, **Henry Martyn**, American German Reformed clergyman and author: b. Mifflinburg, Pa., 5 Oct. 1845. He was graduated from Franklin and Marshall College, Lancaster, Pa., 1870, and from the Theological Seminary there in 1873. Enlisting at 16 as a drummer in a Pennsylvania regiment he served three years, his experiences in that capacity appearing in his popular 'Recollections of a Drummer Boy' (1883). He was pastor of a German Reformed Church at Norristown, Pa., 1873–84 and has held a similar pastorate at Easton, Pa., from the date last named. His 'College Chapel Sermons' was issued in 1891.

Kieft, kēft, **Willem**, Dutch administrator in America: b. Holland about 1600; d. off the Welsh coast 1647. He came as the fifth governor of New Netherlands, and arrived in the colony 28 March 1638. He was greedy, choleric, and tyrannous; began his administration by concentrating the executive power; and was soon involved in troubles with the Indians. In 1640 he despatched a force to murder the Raritan tribe. He was not wholly successful; the act was avenged, and when in 1643 he arranged for the destruction of the River tribe, which had sought the protection of the colony against the Mohawks, he deemed it wise to obtain sanction for the proceeding through the signatures of three citizens. A desolating war ensued, almost to the extinction of the colony. Public sentiment was strong against him, and he finally conceded the selection of a «Council of Twelve,» who stood for the beginning of representative government in New Netherlands, but practically were figure-heads quite disregarded by the governor. The Puritans at the east and the Swedes at the west were making encroachments upon Dutch territory, and Kieft was finally recalled and succeeded by Peter Stuyvesant. On 16 Aug. 1647 he sailed for Holland with his enemy, Dominie Bogardus, who had denounced his tyranny, and whose services he had revengefully disturbed by having soldiers make noises under the meeting-house windows. The vessel was wrecked on the coast of Wales, and Kieft, Bogardus, and nearly all the rest on board were drowned. Kieft rebuilt Fort Amsterdam, improved the appearance of the settlement, and effected several administrative reforms.

Kiel, kēl, town of Prussia, in Holstein, situated on a deep bay of the Baltic, which presents all the appearance of a lake, and has finely wooded banks, 54 miles north by east from Hamburg, with which it is connected by railway. It was formerly the place of meeting for the Schleswig and Holstein states, and the seat of a superior appeal court for the duchies. It possesses a university, founded in 1665, with an attendance of about 900 students, a library of 200,000 volumes, museums for antiquities and ethnology, and a zoological institute. Kiel is admirably situated for trade, the whole bay on which it stands forming a safe roadstead, and the town being provided with spacious quays. Since the construction of the railway connecting it with Hamburg it has entered into formidable competition with Lübeck, and as a fortified naval port of Germany, and the station of the greater part of the imperial fleet, is rapidly rising in importance. The Kaiser-Wilhelm Ship Canal from the mouth of the Elbe joins Kiel Bay at Holtenau, somewhat north of Kiel proper. Kiel has works for sugar, soap, machinery; woolen factories, iron foundries, tan-works, tobacco works, ship-building yards, etc. Pop. (1890), 69,172; (1900), 121,824.

K'ien-Lung, kē-ĕn-loong', emperor of China: b. 1710; d. Peking 7 Feb. 1799. He succeeded his father, Yung-Ching, in 1735. He favored the Christian religion in private, but in 1753 interdicted its exercise by a formal order; and the missionaries were, in consequence, obliged to proceed with great caution, although several of them were in the emperor's service, and treated with great respect as men of science and learning. On the suppression of the Jesuits in 1774 China was less visited by scientific persons than formerly, which induced K'ien-Lung to send to Canton and invite artists and learned men of all the European nations, and particularly astronomers. Resolving to immortalize the remembrance of his victories by the graver, he engaged French artists to copy some Chinese paintings in which they were represented; but Louis XV. had them engraved for him at his own expense. The larger Chinese collection on agriculture contains several poems of this monarch on rural occupations and incidents; and he established a library of 600,000 volumes, containing copies of all the most interesting works in China. In 1795 he abdicated in favor of his son.

Kieserite, kē'zėr-īt, a hydrated magnesium sulphate found at Stassfurt, Germany, and elsewhere, and employed as a source of epsom salts and in the manufacture of manures. Mixed with quicklime and water it hardens into a mass which, after heating, pulverizing, and again mixing with water, becomes of a marble-like consistency, and may be made into ornamental articles, etc.

Kiev, kē'ĕv, or **Kief,** a government of Russia; length, 210 miles; average breadth, about 170 miles; area, 19,691 square miles. The surface is in general flat or undulating. The Dnieper and its affluent the Pripet are the only navigable streams. There are no lakes of any extent. The climate is remarkably mild and dry. The rivers freeze in December, and are again open in February. In summer the heat is so great and the quantity of rain so small that the channels of many streams become dry. Large crops of all kinds of grain are raised, and much attention is paid, especially in the south, both to the rearing of cattle and the dairy. Sugar, tobacco, spirits, and beer are manufactured, and there is a large export of grain, cattle, honey, wax, and tobacco. Pop. (1897) 3,576,125.

Kilauea, kē-low-ā'ä, an active volcano in Hawaii. It has an oval crater, 9 miles in circumference, with a lake of red and boiling lava at the bottom over 1,000 feet below the crater's mouth. The volcano lies 10 miles from the sea, and 30 miles from Hilo, on the eastern slope of Mauna Loa, 4,000 feet above the sea. Kilauea crater forms a great cavity on the side of the mountain, 3 miles long, 2 miles wide and 800 feet deep. At the southwestern end is a small lake of boiling lava called Halemanman, or House of Everlasting Fire. Great eruptions occurred here in 1789, 1823, 1832, 1840, and 1868.

Kilbourne, kĭl'bėrn, **James,** American pioneer: b. New Britain, Conn., 19 Oct. 1770; d. Worthington, Ohio, 9 April 1850. He was successively employed as an apprentice, clerk, merchant, and manufacturer, and having secured a competence, presented himself as a candidate for orders in the Protestant Episcopal Church, and was ordained about 1800. In 1801–2 he organized the Scioto Company, under whose auspices a colony of about 100 persons, under the lead of Kilbourne, was in 1803 established in what is now the township of Worthington, Ohio. Having organized here the Episcopal parish of St. John's, as well as others in the neighborhood, and procured the establishment of a western diocese by the general convention of the Protestant Episcopal Church, he retired from the ministry in 1804, and was soon after appointed a civil magistrate, an officer of militia, frontier, and surveyor of a large portion of the public lands. In 1812 he was one of the commissioners to settle the boundary between the public lands and the great Virginia reservation, and also commissioned as a colonel in the frontier regiment; and in the succeeding year he entered Congress, of which he remained a member until 1817. He was the first to propose donations of lands to actual settlers in the northwest territory, and afterward served for some years in the Ohio legislature.

Kil'deer. See KILLDEE, or KILLDEER.

Kilham, kĭl'ạm, **Alexander,** founder of the Kilhamites or New Connection Methodists: b. Epworth, Lincolnshire, 10 July 1762; d. Nottingham 20 Dec. 1798. He professed conversion at 18, became a preacher in 1783 and two years later was enrolled by Wesley as a regular itinerant. He was strongly in favor of complete separation from the Established Church, a step to which Wesley had always been opposed. On the death of the latter this subject came under discussion. He at once urged separation and sought moreover for the distribution of administrative power between the ministry and the lay members. For several offensive passages in his ‹Progress of Liberty› (1795) the pamphlet in which these views were expounded, he was tried at a conference held in 1796 and expelled from the denomination, upon which he immediately organized the «New Connection Methodists, or Kilhamites.»

Kil'ian, or **Kuln, Saint,** the apostle of Franconia. He was of noble Scottish extraction and had entered a monastery in Ireland when hearing of the spiritual destitution of German Franconia, he asked and received from the pope a commission to preach the Gospel to the German idolators, and with Colman his priest, and Totnan his deacon was instrumental in converting great numbers at Würzburg, and among them Duke Gosbert. On being rebuked by Kilian for marrying Geilana, his brother's widow, Duke Gosbert promised to put her away, and hearing this, Geilana caused the three missionaries to be secretly assassinated (690) without her husband's knowledge. Kilian is honored as the first bishop of Würzburg, and his festival is 8 July.

Kilimanjaro, kĭl-ē-män-jä'rō (the Great Mountain), a double-peaked, snow-clad mountain of Africa, in German East Africa, about 100 miles inland from the port of Mombasa. The highest peak, estimated at 19,270 feet, is the highest known in the African continent.

Killarney, kĭ-lär'nĭ, market town in Ireland, in the county of Kerry, on the Great Southern and Western railway. In summer, Killarney is thronged with visitors to the lakes and the delightful scenery in the neighborhood. Fancy articles of wood, particularly of arbutus, which attains to great perfection in the environs, are made to a considerable extent, and are in great request by tourists. Pop. (1900) 5,500.

Killarney, Lakes of, three connected bodies of water, the lowermost of which is within 1½ miles of the town of Killarney, Ireland. These famous lakes are situated in a basin in the midst of the mountains of Kerry, some of which rise abruptly from the water's edge densely clothed with trees from base to summit. Between the lower and the middle lakes is the fine ruin of Muckross Abbey.

Kill'dee, or **Killdeer**, the most common and best-known species of American plover (*Ægialitis vocifera*). It is found throughout temperate North America, especially in the western United States, breeding northward to Newfoundland and in winter migrating to South and Central America. It is nine or ten inches long and the sexes are similarly colored — brown above with a chestnut tinge on the rump; around the neck is a white ring bounded in front by a complete, and behind by an incomplete black ring; the lower parts are white and there is a white stripe through the eye; the wing-quills and tail are variegated black and white. The killdee is distinctively a bird of the interior, spreading over the prairie lands and fields, and frequenting the seashore chiefly during the winter. During the summer it is usually found in pairs, breeding in corn and hay fields or along water courses. The four, clay-colored, spotted, pyriform eggs are deposited in a slight depression in the ground. Though always noisy birds, the cry or whistle, from which their name is derived, is heard in its perfection when the nest is approached, and the frightened hen endeavors by various devices to lead the intruder away. Like that of other plovers, the food is chiefly of an animal nature. In the late summer and early autumn the killdee is sought by gunners, but much less so than related migratory species of the same genus. Consult: Baird, Brewer and Ridgeway, 'Water-birds of North America'; and Elliot, 'North American Shore Birds.'

Killebrew, kĭl'ĭ-broo, **Joseph Buckner**, American railway official: b. Montgomery County, Tenn., 29 May 1831. He was graduated from the University of North Carolina, was Tennessee commissioner of agriculture and mining in 1871–81, acting superintendent of public instruction there in 1871–3, and in 1880 was appointed by Gen. F. A. Walker special expert for the 10th census on the culture of tobacco in the United States, his report (1881) being an acknowledged authority. In 1893 he became a railway official in the South. He was appointed editor-in-chief of the 'Rural Sun,' and published 'The Resources of Tennessee' (with J. M. Safford, 1874–5); 'Geology of Tennessee' (with Safford, 1876); 'Tobacco Leaf' (with H. Myrick, 1897); and other works.

Killer, a kind of whale, or large porpoise, also called orca or grampus, of the family *Delphinidæ*, and constituting the genus *Orcinus*. It reaches a length of about 25 feet. The head is rounded and the lower jaw is a little shorter than the upper. The dorsal fin is extraordinarily high in the adult males, like a broadsword, nearly vertical and about six feet in length from base to tip; in the female it is prominent but much lower. The pectoral fins are large, broad, and rounded, and the flukes, or tail-fin, also broad and thick. The color is peculiar, being black above and on the fins, and white below; the margins of the two colors sharply defined. The white of the belly extends forward to the end of the lower jaw, and upward on each side where it forms a large, oblong, white area. Above and somewhat behind the eye is a conspicuous oblong, white spot. In the young the white areas are tinged with yellow. The upper and lower jaws are armed with thick, powerful, somewhat curved teeth, numbering in all from 40 to 56.

The killer is the largest and most powerful representative of the dolphin family. It hunts in packs and is rapacious and exceedingly voracious. Unlike all other cetaceans it feeds upon warm-blooded aquatic animals, and chiefly on young seals, porpoises and whales. It attacks the larger whales without hesitation, biting them on the lips and throat, sometimes in order to force them to surrender their young, which are torn to pieces and devoured. In one instance the stomach of a killer was found to contain the bodies of thirteen porpoises and fourteen seals. The best known species (*Orcinus orca*) inhabits all seas. A second species is found in the South Pacific. Others have been described, but their validity is doubtful.

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Killiecrankie, kĭl-ĭ-krăng'kĭ, a pass of Scotland, in the Grampians of northern Perthshire, on the Highland Railway, three miles southeast of Blair-Athole. A viaduct of ten arches carries the railway over the pass. Here Claverhouse, Viscount Dundee, defeated the forces of William III. under Mackay on 7 July 1689, but was killed in the moment of victory.

Kil'lifish, one of a group of small fishes of the family *Cyprinodontidæ*. They have broad, depressed, scaly heads, large cycloid scales, no lateral line, small very protractile mouths with several rows of pointed teeth, and a well-developed air-bladder which possesses somewhat of a pulmonary function. The common killifish, mud-fish, or mummichog (*Fundulus heteroclitus*) seldom exceeds three inches in length, and is exceedingly abundant in shallow waters along the shores of bays and estuaries, in brackish pools, and tidal rivers from Maine to Mexico. It is extremely hardy and is important economically as food for larger fishes. The sexes differ in color. The large killifish (*F. majalis*) reaches a length of six inches, and is found in shallow salt and brackish bays from Florida to Cape Cod. The males have transverse and the females longitudinal black bars. The species of *Fundulus* are oviparous, but some genera of the family are viviparous and strongly dimorphic, sexually.

Killingly, kĭl'ĭng-lĭ, Conn., town, including several villages in Windham County, on the Quinebang and Five Mile rivers, 25 miles northeast of Norwich; on the New England railroad. It has the Danielson Public Library, Danielson High School, churches and town-hall, and manufactures of cotton and woolen goods, boots and shoes, etc. It was settled in 1693, and until 1708 was known as Aspinock. Pop. (1890) 7,027; (1900) 6,835.

Killington (kĭl'ĭng-tŏn) **Peak,** an elevation of the Green Mountains, in the State of Vermont; about 10 miles southeast of Rutland. It is 4,241 feet high, and the view from its summit is most beautiful; a large number of pretty villages and charming valley may be seen on a clear day.

Kiln Pottery. After centuries of gradual development kilns as used in the clay industries have become fixed, so far as may be, in three general types, up-draft, down-draft and muffle kilns. The last named stands alone as its distinctive feature lies not in the method of firing or the direction of the draft but in the fact that the kiln consists of a single laboratory closed to the direct entrance of flame and heated by radiation through the walls. This type of kiln is used in all cases where it is necessary that the contained wares should be protected from dust and smoke but where it is not convenient to enclose them in saggers. Large ware such as porcelain bath-tubs and sinks, heavy pieces of terra-cotta, etc., cannot be set in saggers as pottery is on account of weight and size. They are therefore burned in a muffle kiln being set directly upon the brick floor. Muffle kilns are also used for burning painted wares. These are smaller than the kilns for heavy goods and are burned to a much lower temperature. Such kilns can be set, burned, cooled and drawn in 24 hours, while the large muffles cannot be turned in less than 10 days.

General kilns for pottery burning are of the open type. The wares are enclosed in saggers which are set over one another in tiers (bungs). Saggers are cases made of refractory clay and suited as to size to the wares they are to contain. The flames and kiln gases pass freely round the saggers and the whole chamber is uniformly heated.

The usual form of kiln is cylindrical with a slightly domed crown. Outside this is the «hovel» or conical top familiar to the inhabitants of pottery towns. The hovel serves the purpose of a chimney and collects the smoke from a number of apertures in the kiln crown. The fire mouths range in number from six to ten according to the size of the kiln. In the up-draft kiln the gases simply pass up between the bungs of saggers and find a free vent at the top. In the down-draft type the top of the crown is closed and the gases after passing up the walls and under the crown are led down a centre stack and up again through flues arranged for the purpose. The structure of the down-draft kiln is more complicated than the up-draft, but a considerable economy of fuel is effected. The kiln also cools more rapidly.

Kilns for burning brick follow the same general lines but vary in form. For this purpose the square kiln is among the most popular, being usually operated on the down-draft principle.

Many plans have been devised for the perfect utilization of heat, but none that is entirely satisfactory One of the best is that of the continuous kiln. This has been applied in Germany to the burning of porcelain, but nothing better than brick has been entrusted to it in America. The continuous kiln is a long low tunnel built in the form of a parallelogram with rounded ends. This is divided into as many chambers as may be necessary, each chamber having an entrance at each side and two fire mouths. Paper partitions are used in order to secure the correct movement of the draft, and as each successive chamber is filled with ware and the proper dampers opened the heat from the burning chambers is drawn through the unburned brick bringing them up to a high temperature without any additional fuel. Meanwhile the chambers in which the firing has been completed are beginning to cool and so the work goes on continuously. The economy of the method is very great, but a considerable output is necessary in order to avoid stoppage. Kilns are, for the most part, burned with coal, both hard and soft coals being used. Those in the gas belt are successfully burned with natural gas and in some places oil is used. The temperatures at which different wares are burned are about as follows:

Roofing tile and paving brick	1030°–1070°C
Common brick and drain tile	1090°–1170°C
Faience art pottery — glaze	1150°C
Faience art pottery — body	1230°C
Sewer-pipe and stoneware	1250°–1290°C
Earthenware dishes	1290°–1310°C
Hotel china	1330°C
Bone china	1330°C
Hard porcelain	1390°–1410°C

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Kil'o. See METRIC SYSTEM.

Kil'ogramme, or **Kilogram,** a French measure of weight = 1,000 grammes. See METRIC SYSTEM.

Kil'oliter, kĭl'ō-lē-tėr, or **Kilolitre,** a French measure of capacity for fluids, 1,000 liters. See METRIC SYSTEM.

Kil'owatt. See UNITS; WATT.

Kilpat'rick, Hugh Judson, American soldier: b. Deckertown, N. J., 14 Jan. 1836; d. Valparaiso, Chile, 4 Dec. 1881. He was graduated at West Point in 1861, and in the autumn of that year became a lieutenant-colonel of cavalry. He was appointed a brigadier-general of volunteers in May 1863, and in the following March was active in a raid to Richmond for the release of Federal prisoners. He commanded the cavalry of Sherman's army in its march from Atlanta to Savannah, in 1864, and in June 1865 was promoted major-general of volunteers. After the War he was prominent as a lecturer and a Republican political speaker. He was minister to Chile from 1865 to 1870, and was reappointed in 1881. In 1887 his remains were removed from Chile and interred at West Point. Consult: Moore, 'Kilpatrick and our Cavalry' (1865).

Kim'ball, Hannah Parker, American poet: b. Boston, Mass., 25 April 1861. She has published: 'Soul and Sense' (1890); 'Victory and Other Verses' (1897).

Kimball, Harriet McEwen, American religious poet: b. Portsmouth, N. H. November 1834. Although she has written much verse of a secular nature, it is as a religious poet that she is best known, and several of her lyrics have found an honored place in hymnals. She was the principal founder of the cottage hospital in her native city. Her published works include: ‘Hymns’; ‘Swallow Flights’; ‘The Blessed Company of All Faithful People’; ‘Complete Poems’ (1889).

Kimball, Heber Chase, American Mormon leader: b. Sheldon, Franklin County, Vt., 14 June 1801; d. Salt Lake City, Utah, 22 June 1868. In 1832 he was baptized into the Church of Latter-Day Saints, in the same year was ordained an elder of the church by Joseph Smith, and in 1835 became one of the 12 Mormon apostles. In 1838 with Brigham Young he led the Mormons from Missouri into Illinois, where they finally settled at Nauvoo, and in 1847 was a pioneer in the exodus to the valley of Great Salt Lake. He was successively chief priest of the order of Melchizidek (1846), a councillor to Young (1847), and chief justice and lieutenant-governor of Deseret.

Kimball, Richard Burleigh, American author: b. Plainfield, N. H., 11 Oct. 1816; d. New York 28 Dec. 1892. He was graduated at Dartmouth College in 1834 and later admitted to the bar; practised his profession at first in Waterford, N. Y., and afterward in New York. He founded the town of Kimball, Texas, and constructed the first railroad in that State, extending from Galveston to and beyond Houston. His publications include: ‘Letters from England’ (1842); ‘Cuba and the Cubans’ (1850); ‘Saint Leger’ (1850); ‘Romance of Student Life Abroad’ (1853); ‘Under-Currents of Wall Street’ (1862); ‘Henry Powers, Banker’ (1868); ‘Today in New York’ (1870); ‘Stories of Exceptional Life’ (1887).

Kimball, Sumner Increase, organizer and superintendent of the United States Life Saving Service: b. Lebanon, York County, Maine, 2 Sept. 1834. He was graduated from Bowdoin in 1855; studied law, and was admitted to the bar in 1858. In 1859 he served in the State legislature, and was a member of the committee on judiciary. In 1862 he became a clerk in the second auditor's office in the Treasury Department at Washington, and in 1871 was made chief of the revenue marine service. In that position he had occasion to investigate the condition of the government stations on the New Jersey and Long Island coast where surf boats and other apparatus were stored under the charge of a keeper for use in case of shipwreck; he found the property badly cared for, and the service inefficient. Obtaining an appropriation from Congress he entirely reorganized the service, and so successfully that it was soon extended to Cape Cod and other points on the Atlantic coast. In 1878 the life saving service was organized as a separate bureau and was extended to the Pacific coast and the Great Lakes. He was made the head of the bureau and has introduced many improved methods, including the patrol system, and telephonic connection between adjacent stations; he also obtained the passage of the law, to the effect that inspectors, keepers and crews in the service should be appointed on a strictly non-partisan basis «with reference solely to their fitness.» He has also been acting register, acting comptroller, and acting solicitor of the Treasury; and in 1889 he was the United States delegate to the International Marine Conference. He has written ‘Organization and Methods of the United States Life Saving Service’ (1889), the most complete monograph on the subject.

Kimberley, kĭm'bėr-lĭ, **Lewis Ashfield,** American rear-admiral: b. Troy, N. Y., 2 April 1830. He was appointed to the navy in 1846 and was graduated from the Naval Academy in 1852. In the Civil War as executive officer of the Hartford, Farragut's flagship, he took part in the contests at Port Hudson, Grand Gulf, Warrington, and Mobile Bay; and in 1871 accompanied the United States expedition to Korea. In 1880–3 he commanded the navy-yard at New York, in 1884–5 was a member of the examining and retiring board, in 1885–6 was in command of the Boston navy-yard, in 1887 was promoted to rear-admiral, and in 1892 was retired.

Kimberley, Australia, a northern district of Western Australia, brought into notice by the discovery of gold fields in 1886. It contains immense tracts of splendid pasture and much land suitable for cultivation. The chief port for the district is Derby, on the Fitzroy River, near King Sound. The district, which has an area of 144,000 square miles, is divided into East and West Kimberley. It is separated from the more populous parts of the colony by a stretch of sandy desert.

Kimberley, South Africa, town of Cape Colony, the capital of Griqualand West and of the South African diamond fields, is situated at a distance of 647 miles by rail from Cape Town, and close to the western boundary of the Orange River Colony. Kimberley owes its existence and prosperity to the mining of diamonds, an industry that began in 1870. It stands on an open plain, has wide straight streets, good public and other buildings, and receives a supply of water from the Vaal, 17 miles distant. Some of the most important buildings are the High Court of Griqualand West; the public library; the Kimberley Club, rebuilt in 1895 after destruction by fire; the Masonic Temple; a municipal sanatorium; theatres; several churches and a synagogue, etc. The most important diamond mines are those called Kimberley, De Beers, Bultfontein, Du Toit's Pan, and Wesselton. During the South African war Kimberley was invested by the Boers for 123 days, from 15 Oct. 1899, till its relief by General French on 15 Feb. 1900. Diamonds to the value of over £60,000,000 have been obtained here. Pop. 28,718.

Kimchi, kĭm'kē, **David,** or **Rdak** (RABBI DAVID KIMCHI), Hebrew philologist: b. Narbonne 1160; d. 1240. He was the most learned member of a learned family, and maintains to-day his reputation as grammarian, lexicographer, and exegete. Besides his commentary on Genesis, Chronicles, the Prophets, and the Psalms, he wrote a grammar, ‘Michlol’ (Venice 1545); a Hebrew dictionary, ‘Sefer Haschoraschin,’ which was practically a list of roots (Naples 1490). He also wrote a tract under the title ‘El Sofer,’ which treated of the Massora and the Hebrew Accents and was published for the first time in 1864.

Kinah, kī'nä, **The,** a Hebrew metrical form, usually employed in dirges and songs of mourning, such as the Lamentations of Jeremiah. Each verse member is divided by a cæsura into two unequal parts, of which the first is the longer. The shorter clause simply enforces the thought expressed in the longer; as in the following example:

«He was unto me as a bear lying in wait || a lion in secret places.»

«And thou hast removed my soul far off from peace || I forgot prosperity.»

The kinah, with its long drawn out clause, and its short abrupt closing phrase, is still employed in Oriental countries. It has the effect of a cry, followed by a sob. It seems to halt like the metre which in classic times was called the halting iambus, and it might fittingly be styled the Semitic choliambus.

Kindergarten in America. The kindergarten is a form of education for children too young to enter the regular schools. The principles and methods of the kindergarten were worked out by Friedrich Froebel (q.v.). Its ideal is to develop the child's mental and moral powers through a wise direction of the child's natural self-activity or «play.» Mental development is attained through a connected series of simple objects, called «gifts,» from which the children learn the facts of form, color, size, weight, measure, and general relationship; and through a series of simple occupations in plaiting, weaving, modeling, etc., in which the knowledge gained is used and the powers of observation and attention developed. Games, music and story-telling are also important parts of the work; and much emphasis is laid on the development of the social instincts and sympathies of the children.

The history of the kindergarten in America is the record of four sharply defined movements; the pioneer movement, whose point of departure was the city of Boston; the philanthropic movement, whose initial effort was made in the village of Florence, Mass., and whose greatest triumphs have been achieved in San Francisco; the national movement, which emanated from St. Louis; and the maternal movement which, radiating from Chicago, is now spreading throughout the United States. The first of these movements called public attention to the several most important aspects of the Froebelian ideal; the second demonstrated the efficiency of the new education as a redemptive force; the third is making the kindergarten an integral part of the national school system; the fourth is evolving a more enlightened and consecrated motherhood and thereby strengthening the foundations and elevating the ideals of American family life.

Pioneer Movement.— In 1840 the first kindergarten was established by Friedrich Froebel at Blankenburg, Germany. Nineteen years later Miss Elizabeth Peabody of Boston became interested in Froebel's writings. In 1867 she went to Germany to study the kindergarten system. Returning to America in 1868 she devoted the remainder of her life to the propagation of Froebel's educational principles. Through her labors parents were inspired to seek the help of the kindergarten in the education of their children; philanthropists were incited to establish charity kindergartens; the Boston school board was persuaded to open an experimental kindergarten in one of its public schools and a periodical devoted to the elucidation and dissemination of Froebelian ideals was founded and sustained for four years. The pioneer movement, therefore, broke paths in the four directions of private, public, philanthropic and literary work. Above all through the contagious power of devout enthusiasm it created the consecrated endeavor without which the kindergarten as Froebel conceived it can have no actual embodiment.

In 1872 an independent pioneer movement was begun in New York by Miss Henrietta Haines who invited Miss Boelte to conduct a kindergarten in her school for young ladies. Miss Boelte had studied three years with Froebel's widow, had won a high reputation in Germany, and later had done efficient work in England. About a year after her arrival in America she married Prof. John Kraus and established an independent kindergarten and normal class. Her normal work still continues and she is to-day the leading representative in America of the Froebel tradition. The power of her work results from her resolute adherence to all the details of the original Froebelian method. By this unswerving conformity she has kept alive, through their practical application, ideas which are of the highest importance to the theoretic development of the kindergarten system.

Philanthropic Movement.— In 1874 Mr. S. H. Hill, of Florence, Mass., contributed funds to open the first charity kindergarten in the United States and later put in trust a sum sufficient to sustain and extend the work. Four years later a philanthropic movement was initiated in Boston by Mrs. Quincy A. Shaw, who for the ensuing 14 years supported free kindergartens for poor children, these beneficent institutions reaching at one time to 30 in number. The influence of her example has doubtless conspired with other causes to create the numerous local associations which are now rendering efficient service to the Froebelian cause in different sections of the United States. Of such philanthropic associations the wealthiest and best organized is the Golden Gate association of San Francisco. At the time of its greatest prosperity this organization supported 41 kindergartens, had given training to more than 30,000 children, and had received contributions amounting to $500,000; unfortunately the financial depression of 1893 reduced its subscription list, and the number of its kindergartens dwindled to 23; it conducts a training school for kindergartners. Other associations deserving special mention are the New York Kindergarten association, whose aim is to provide for the children against whom the overcrowded public schools still close their doors; the Brooklyn association, under whose auspices many mothers' meetings are conducted; the Pittsburg and Allegheny association; the Cincinnati association; the Free Kindergarten association of Chicago, which has a flourishing normal school; the Chicago Froebel association, which organized the first charity kindergarten in that city; the Louisville association, which has parents, nurses, Sunday school, boarding and normal departments. Kindergarten work has also been taken up by many churches, kindergarten methods being introduced in the Sunday school, and day kindergartens established under church management; All Souls' church of New York city was the first to open a day kindergarten. The total number of private kindergartens in the United States in 1901 was 2,996, with 93,737 children enrolled.

National Movement.— Valuable as is the work accomplished by private kindergartens and kindergarten associations, it is necessarily a restricted work; and had the Froebelian movement developed only upon these lines the kindergarten must have remained forever the privilege of the wealthy few, and the occasional gift of charity to the abject poor. The public kindergarten opened in Boston, though carried on for several years, was finally given up upon the plea that the city could not afford to appropriate funds to extend the system, and a second public kindergarten, which was opened in Brighton, Mass., in January 1873, was abolished when Brighton was annexed to Boston in 1874. Meantime, however, Hon. William T. Harris, who was then superintendent of schools in St. Louis, had called attention to the kindergarten and suggested that experiments be made with a view to introducing into the public school such features of the system as might prove helpful in the education of children between the ages of four and six. The outcome of this suggestion was the opening of an experimental kindergarten in the fall of 1873. The work was approved by the school board; new kindergartens were opened as rapidly as competent directors could be prepared to take charge of them, and when Dr. Harris resigned his position as superintendent in 1880 the St. Louis kindergartens had an enrolment of 7,828 children and the system was so firmly established that it has since that time proved itself impregnable to all attack.

The experiment in St. Louis was a crucial one, and had it failed it would have been difficult to prevail upon other cities to introduce the kindergarten into their public schools. There were many ready arguments against such an innovation: the argument from expense; the argument based on the age of kindergarten children; the argument that kindergartens would spoil the children and fill the primary grade with intractable pupils; the argument that only rarely endowed and, therefore, rarely to be found persons could successfully conduct a kindergarten. These arguments would have acquired irresistible force when confirmed by an abortive experiment. Dr. Harris steered the kindergarten cause through stormy waters to a safe harbor. He proved that the kindergarten could be made an integral part of the public school system. He reduced the annual expense to less than five dollars for each child. He called attention to the fact that the years between four and six were critical ones and that the needs of the child at this period were not provided for either by the family or the school. He convinced himself that children who had attended kindergartens conducted by competent directors did better on entering school than those who had received no such training, and the weight of his authoritative statement gave other educators faith in the possibilities of the system. Finally, he proved that with wise training young women of average ability made satisfactory kindergartners. It was impossible to go on repeating that a thing could not be done in the face of the fact that it had been done, and with the success of the experiment in St. Louis recognition of the kindergarten as the first stage of all public education became simply a matter of time.

In a report entitled 'Early History of the Kindergarten in St. Louis' Dr. Harris reduced his argument in favor of the kindergarten to a brief statement which no one could dispute and whose force everyone could appreciate; and immediately upon the publication of his report the movement in favor of public kindergartens showed an increased momentum. In the years which have elapsed since the successful experiment in St. Louis the kindergarten has been made part of the public school system in 293 cities; the total number of public kindergartens has increased to 2,111 with 3,611 teachers and 149,710 pupils. The cities which have the most fully developed systems of public kindergartens are Boston, Chicago, St. Louis, Philadelphia, New York, Brooklyn, Newark, Milwaukee, and Los Angeles. Philadelphia, which reports 142 kindergartens, leads in number all the cities of the United States. New York follows with 135 kindergartens, St. Louis with 125, Chicago with 89 and Boston with 78. An estimate, based on the sale of kindergarten material, fixes the total number of kindergartens in New York at over 600, so that, including private work and association work, this city has presumably a more extensive provision of kindergartens than any other in the United States.

The following 10 States have the most extensive provision of kindergartens, public and private. The order of the names indicates the relative extent of the provision:

1. **New York**
2. **Pennsylvania**
3. **Massachusetts**
4. **Illinois**
5. **Michigan**
6. **New Jersey**
7. **California**
8. **Ohio**
9. **Wisconsin**
10. **Missouri**

In the year 1873 the National bureau of education began collecting statistics with regard to the total number of kindergartens in the United States. The results are necessarily imperfect, but they enable us to form an approximate idea of the growth of the system. Taking public and private work together, the advance of the kindergarten is shown in the following table:

	1873	1882	1892	1902
Kindergartens	42	348	1,311	5,107
Teachers	73	814	2,535	9,926
Pupils	1,252	16,916	65,296	243,447

Results of Kindergarten Instruction.—Since the aim of the kindergarten is not instruction, but development, its results cannot be tested by examinations or expressed in statistical tables, but must be gathered from the testimony of experts who have had time and opportunity to study its influence. In other words, kindergarten children must be judged by elementary teachers and principals of schools, and unless, upon entering the primary grade, they show superiority to children coming direct from the home, the kindergarten cannot be said to have justified its adoption into our national system of education. Conversely, if the mental and moral superiority of kindergarten children prove to have converted primary teachers and school principals from enemies into warm friends of the Froebelian method, this fact should be accepted as convincing evidence of the merit of the work.

Before presenting the testimony which has been collected, it is necessary to call attention to the fact that, in the kindergarten talking is not forbidden, but, on the contrary, children are encouraged to share with the kindergartner and with each other all their happy experience of effort and success. It is, therefore, natural that pupils promoted from the kindergarten should not at first understand the law of silence imposed by the character of the work in the elementary grades, and hence that, without any bad motive on their own part, they should prove troublesome pupils during the first weeks of school life. The failure to understand this fact has caused some unjust criticism of kindergarten children. It will, however, be apparent to all who read carefully the testimony submitted that the adjustment of the kindergarten child to the school environment is a problem which is at present rapidly progressing toward a happy solution.

The more complete the testimony offered, the more certainly should we expect to find some differences of opinion as to the characteristics of kindergarten children. In any large city there will probably be a few incompetent kindergartners and some unintelligent or reactionary primary teachers. That the kindergarten fails to commend itself to teachers who are themselves mere martinets should be accounted a merit rather than a defect. The condemnation of incompetent kindergartners by wise primary teachers is a cause of rejoicing to all true friends of the Froebelian method. The influence of the kindergarten should be determined by the majority report. Variations of opinion should be explained by the occasional defect of the kindergartens and the occasional incapacity or prejudice of the judge.

The most extensive and carefully collected information comes from Boston, and consists of 163 letters from teachers of the first grade in reply to a number of questions sent out by the superintendent of schools.

Of the 163 letters those reporting that less than 10 per cent of the children attending the given primary room had received kindergarten training have been eliminated; also several letters based upon experience with children who had been only a few weeks or months in the kindergarten. The total number of letters omitted was 36. Of the remaining 127 letters 102 are favorable and 25 unfavorable to the kindergarten. Among the letters which are classed as unfavorable one only is unqualified in its disapprobation. All the others admit some distinctive merits in kindergarten children, those most frequently specified being Increased power of observation and linguistic expression, greater manual skill, and more general information. The most frequent criticisms are that kindergarten children are talkative and not easily amenable to school discipline. Contrasting the 102 favorable with the 25 unfavorable letters, the first fact which thrusts itself upon the notice of the reader is that the majority of their writers seem to have had little difficulty in solving the problem of discipline. A large proportion of these letters make no direct reference to this question, while the account given of the moral characteristics of kindergarten children precludes the thought that they have been found difficult to control.

Replying to the questions with regard to the relative progress of kindergarten children and the character of their work 38 teachers report both a progress quicker in point of time and improvement in the quality of work; 13 teachers report increased rapidity without change in the character of work, and 28 improvement in the character of work without increased rapidity of progress. Thus 51 report greater rapidity, 66 improvement in quality of work, and 79 a decided gain either in speed or quality or in both. The remaining 23 teachers seem to consider that kindergarten training increases the child's general intelligence but does not noticeably affect the ordinary routine of school work.

To the disciple of Froebel the most interesting paragraphs of the Boston letters are those which answer the question, "What, if anything, have you observed as to the characteristics of kindergarten children as compared with other children?" The specific gains mentioned are clearer ideas of number, form and color; greater knowledge of and interest in nature, improved singing, better expression in reading, improved articulation, more orderly and careful arrangement of material in busy work, and greater manual skill shown especially in writing and drawing. The intellectual characteristics of kindergarten children as compared with others are said to be a greater general activity of mind, quicker comprehension, a more receptive mental attitude, greater logical power, greater concentration, more imagination, greatly increased powers of observation and expression, quicker recognition of likenesses, differences and relations, greater love for the beautiful, and visibly increased originality and creative power. Of their moral characteristics it is said that as compared with others kindergarten children are neater, cleaner, more orderly, more industrious and more persevering. They are also more self-reliant, more painstaking and more self-helpful. They are less self-conscious and more polite. They obey more quickly and are more gentle toward each other. They have a more developed spirit of helpfulness. They are more eager, alert, enthusiastic and responsive. They are interested in a wider range of subjects. They have finer sensibilities, manifest love for and confidence in their teachers, and show special interest in everything pertaining to home and family life.

In regard to the St. Louis kindergartens 13 letters, written by teachers of the first grade, reported the progress of kindergarten children in each of the several districts of the city. Two of the letters were eliminated in condensing the reports, because, while kindly in feeling, they were not precise in statement. Of the remaining 11 letters 9 reported that kindergarten children were proficient in arithmetic, and affirmed the conviction that the training of the kindergarten facilitated progress in learning to write, and was of marked value in learning to read. The other two recognized no difference in these respects between kindergarten children and children who came to school direct from the home. The unanimous verdict was that kindergarten children were superior to others in drawing. All the letters concurred likewise in the statement that kindergarten culture developed the æsthetic sense. The intellectual characteristics specified were accurate observations; correct expression; power to make numerical combinations; familiarity with geometric forms; quick recognition of magnitude and relation; a generally increased perceptive power, and signal ability in illustrating poems and stories. With regard to manners and morals 9 teachers recognized the good influence of the kindergarten. Of the remaining two one found "few causes for complaint," and the other referred merely to a possible good effect upon order and punctuality. The moral characteristics which were said to distinguish kindergarten children were order, cleanliness, courtesy, consideration, kindness, a perceptible development of the ideal of social dependence and "a love for the beautiful in character."

Dr. E. Benj. Andrews, when superintendent of schools in Chicago, wrote: "Our best first grade pupils are from the kindergarten, and the influence of kindergarten teaching is more and more felt in all the grades. Its ethical and social value is equal to its intellectual value"; and principals of schools in that city gave equally favorable testimony. Since the kindergarten system has been more highly developed in Boston, Chicago and St. Louis than in other places, testimony from these cities is of the highest importance; similar results are however, showing themselves in many smaller cities and towns.

Dangers of Kindergarten Education.—In view of the attacks so freely and insistently made upon what is called the "sentimentalism" of the kindergarten, it may be well to call attention to the fact that none of the expert witnesses whose testimony has been quoted seem to have detected its existence. Undoubtedly among kindergartners there are some sentimentalists; but that sentimentalism is inherent in the Froebelian ideal or tolerated in the best training schools for kindergartners may be unhesitatingly denied. There is greater danger of its appearance in private than in public work, because any person calling herself a kindergartner may be accepted as such by ignorant or thoughtless parents. In public kindergartens under competent supervision its persistence is impossible.

It is greatly to be desired that all cities establishing kindergartens in connection with their public schools, should insist upon having a specially qualified supervisor. Without watchful and intelligent guidance the kindergarten tends either to relapse into a mere play school or to become too closely conformed to the primary school. The ideal supervisor stands to the individual kindergartner in a relation similar to that which the latter occupies toward her children. She quickens their intellectual and moral aspiration, deepens in them the complementary impulses of self-culture and child-nurture, points out practical errors and suggests the ways and means of overcoming them. She must thoroughly understand the method of the kindergarten, its psychologic implications and its relationship to education as a whole. She must unite intellectual insight with moral earnestness and practical sagacity. Hence only the most gifted and illuminated kindergartners are adequate to the work of supervision.

Two great dangers assail the kindergarten and threaten to impede its progress toward the realization of Froebel's ideal. The first of these dangers is reversion to instinctive games and traditional toys. In some kindergartens, children are taught to play street games, while it has recently been urged that peg boards, tops, bean bags, kites, dolls, jackstraws, hoops, spool, chalk and wire games and the whole toy world" should be added to the Froebelian instrumentalities. Tendencies such as these indicate a complete failure to comprehend what Froebel has done. He recognized in traditional games the deposit of unconscious reason; preserved what was good and omitted what was crude and coarse in these products of instinct; supplied missing links and presented a series of games wherein each is related to all the others and which, by means of dramatic and graphic representation, poetry and music, win for the ideals they embody a controlling power over the imagination. In like manner, from among traditional toys he selected those which possessed most educative value, ordered them into a related series and suggested a method by which they might be consciously used to interpret the child's experiences and develop his creative power. If this transfiguration of traditional games and toys is valueless, then the kindergarten has no *raison d'être.* But if Froebel has translated the hieroglyphic of instinctive play and found means which, without detriment to the child's spontaneity, influence the growth of character and the trend of thought, then the clamor for street games and promiscuous toys is educational atavism.

The second danger which threatens the integrity of the kindergarten is the substitution of exercises which attempt to wind thought around some arbitrarily chosen centre for those Froebelian exercises whose confessed aim is to assist thought to unwind itself. Too many kindergartners have allowed themselves to be betrayed into selecting some object such as a pine tree or a potato, and making all songs, games, stories and gift exercises revolve around it. Between these so-called cores of interest and the exercises clustered around them there is no valid connection. The clustering like the subject depends wholly upon the caprice of the teacher. Could such exercises succeed in their object the pupils of different teachers would have their thoughts set to revolving around different centres and more than this around arbitrary and contingent centres. That such a procedure directly contradicts Froebel's ideal will be apparent to all who have understood his writings. That it likewise contradicts every true ideal of education will be evident to all who understand that the function of education is to substitute objective and universal for subjective and contingent associations. The discovery of related qualities in nature, the disclosure of their causes and the reduction of these causes to a system is the great work of science. The discovery of the related activities of mind and their genetic evolution is the work of psychology. The portrayal of the universal and divine man latent in each individual is the supreme achievement of literature and art. To lead pupils away from what is capricious, arbitrary and accidental, and thus capacitate them to receive and augment their scientific, æsthetic, literary and psychologic inheritance is the great duty of education. The substitution of arbitrary for necessary cores of thought wherever attempted is, therefore, the parody of education.

Normal Schools.— The future of the kindergarten in the United States is largely dependent upon the work of the normal schools for kindergartners. The friends of the system must, therefore, view with disapprobation and even with dismay the rapid multiplication of schools with low standards of admission and a low conception of the training they should give. Inexperienced students are attracted to such schools, and the result is that the whole country is flooded with so-called kindergartners who are ignorant of the first principles of true education.

In the early days of the Froebelian movement it was believed that in a single year young girls could be prepared to conduct a kindergarten. In most reputable training schools the course has now been extended to cover two years. The requirements for admission into these schools are, generally, graduation from a high school, or an education equivalent thereto. The courses of study include theory of the kindergarten gifts and occupations, study of the Mother Play, practice in songs and games, physical culture, lessons in singing, drawing, modeling and color, lectures on the art of story telling, and more or less observation of the practical work of the kindergarten. Finally, some trainers insist that their normal pupils shall not only observe but assist in actual work with the children. In addition to this specific training, the best normal schools offer courses in science, literature, psychology, and the history of education.

Besides private normal schools and training schools connected with kindergarten associations, kindergarten departments have been established in several great *quasi*-public institutions. Among the most notable of these are the kindergarten department of Pratt institute, Brooklyn, and of Teachers college, Columbia university, and of Workingman's institute, New York. A number of the public normal schools in the United States provide some kind of kindergarten training, the courses varying in length from about two years to six months. These kindergarten departments are found in the normal schools of the following States: New York, Michigan, Pennsylvania, California, Massachusetts, New Jersey, Connecticut, Wisconsin, Illinois, Colorado, Kansas, Rhode Island, Georgia, Nebraska, Ohio, Minnesota.

Kindergartners are admitted to surpass all other teachers as students of educational literature. They are also distinguishing themselves by zealous and persistent attendance upon post-graduate courses in pedagogics, science, literature, history and psychology. Through the efforts of the Chicago kindergarten college post-graduate work of a high order has become a feature of Froebelian activity in that city; in Boston, during successive winters post-graduate classes have been organized in the study of Mother Play, and the pedagogics of the kindergarten; and courses in literature and psychology have also been given. Similar work has been developed in New York, Baltimore, Washington, and other cities.

Maternal Movement.— The power of the kindergarten over the minds of its students arises from the fact that it connects the ideal of self-culture with the ideal of child-nurture. And the true woman responds with whole heart to the appeal to learn all she can, be all she can, and devote all she is and all she knows to the service of childhood. Rooted in maternal impulses it would be strange indeed if the kindergarten did not appeal to mothers. That classes for mothers should come into existence was a predestined phase of the Froebelian movement. Whoever has studied the writings of Froebel knows that the education of mothers was one of the most important features of his endeavor. Practically, however, the work in this direction amounted to very little until a mothers' department was established in that unique institution, the Chicago kindergarten college. This institution has consciously attempted the transformation of a girls' college into a school for motherhood; while giving general culture its supreme aim is to fit women for motherhood, and it gives instruction to mothers as well as to young girls; in a single year over 700 women attended its mothers' department; recently the work of this department has been extended by holding convocations for the discussion of all phases of child-nurture. Radiating from the kindergarten college as its centre the maternal movement is spreading throughout the United States. It is the highest reach of the Froebelian ideal and means nothing less than the attempted regeneration of all human life through the regeneration of the family. In connection with this movement mothers' clubs have been formed, whose work is usually done on three main lines: (1) kindergarten classes for the children; (2) training and study classes for mothers; (3) lecture courses in literature, science, music, etc.

Froebel's supreme claim to our grateful remembrance rests upon the fact that consciously repeating the unconscious process of social evolution he set the little child in front of the great army of advancing humanity. Science affirms that the feebleness of infancy created the family and that from the family have been evolved the higher institutions. In his cry, «Come, let us live for the children,» Froebel utters in articulate speech the ideal whose unconscious impulsion set in motion the drama of human history. The little child was pioneer of the process which created human institutions. We must make him the pioneer of their perfection.

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Susan E. Blow.

Kinemat'ics, a branch of mathematics which treats of the motions of bodies independently of the forces which produce these motions; it is usually treated of in the introductory parts of works on kinetics (popularly termed dynamics).

Kinet'ic Theory of Gases. On any kinetic theory the molecules of a gas are conceived to be in motion in paths long compared with their own size, the average length of path being called the «mean free path.» See MATTER.

Kinetogenesis. The mechanics of evolution (q.v.). This is a term suggested by E. D. Cope, meaning development by motion, or the exercise of parts or organs, and is nearly the equivalent of use (q.v.). The examples given by Cope are the development by use of muscles of any hard parts or bone. He claims that muscular tissue is highly plastic, and since it is directly controlled by nervous or equivalent stimuli, «the effect of the latter in building structure is evident.» Another example, overlooked by late students, is the beautiful study on the mechanical genesis of bone structure published by Wyman in 1857. This anatomist shows that the cancellated structure of the bone (see BONE) in the lumbar vertebræ, the thigh-bone, tibia, astragalus, and os calcis of man is peculiar to him, and has «a definite relation to the erect position which is naturally assumed by man alone.»

The fibres or cancelli of such bones as assist in supporting the weight «are arranged either in the direction of that weight, or in such a manner as to support and brace those cancelli which are in that direction. In a mechanical point of view they may be regarded in nearly all these bones as a series of studs and braces.» Wyman dealing with the individual bones shows in what direction force or weight is applied to them, and the corresponding direction the cancelli assume. On the lumbar vertebræ there is vertical pressure, and the principal bone fibres within are also vertical. On the neck of the thigh bone the weight of the body is applied obliquely to the end of an arm, «within it there is a combination of fibres giving strength with lightness, which forms a frame mechanically adapted for resisting the weight which rests upon it,» and so with the astragalus. «A certain direction of fibres in all these instances co-exists with a certain direction, or certain directions, of the transmission of pressure. From this constant association of structures and function the inference seems unavoidable, that they are means and ends.»

Comparing the bones in question with those of the gorilla and chimpanzee, only «slight traces of the trusswork described in man exist.» As they practically exist in man alone, Wyman maintains that «they relate to the kind of locomotion which he alone of the whole animal series can be said to possess, namely, that of walking erect, and which requires in the passive and resisting organs subservient to it, in order that it may be effected with ease and grace, a nice combination of lightness with strength in the materials. His attitude more than any other, in consequence of the pillars of support being arranged in vertical planes, requires the most effectual means for counteracting shocks."

Cope's contributions to this subject in the way of materials drawn from fossil vertebrates are extensive and weighty. He, and also Ryder, have discussed the molding of the limb-joints as the result of mechanical strains; also the origin of the teeth, through mechanical strains and impacts. Thus the origin of the canine, pseudocanine and canine-like incisor teeth «is due to the strains sustained by them on account of their position in the jaws at points which are naturally utilized in the seizing of prey, or the fighting of enemies.» For example the greatly increased size of the canine teeth of the walrus is due to the use of these teeth in the breaking of ice, and in climbing from the water upon the edge of the floe ice. It is so, adds Cope, with the straight incisors of the hippopotamus, «use as diggers has straightened them to a horizontal from their primitive vertical direction, a change which is also partially accomplished in the true pigs (*Sus*).»

The molar teeth owe their increased diameters to much more severe direct irritation and impact. The origin of the sectorial or shear-like molar teeth of the cat, lion, and other carnivora is thus explained by Cope: «The specialization of one tooth to the exclusion of others as a sectorial, appears to be due to the following causes: It is to be observed in the first place that when a carnivore devours a carcass, it cuts off masses with its sectorials, using them as shears. In so doing it brings the part to be divided to the angle or canthus of the soft walls of the mouth, which is at the front of the masseter muscle. At this point the greatest amount of force is gained, since the weight is thus brought immediately to the power, which would not be the case were the sectorial situated much in front of the masseter. On the other hand, the sectorial could not be situated farther back, since it would then be inaccessible to a carcass or mass too large to be taken into the mouth.»

The great length and chisel-like incisor teeth of the squirrel and other rodents also illustrate this subject. Their progressive lengthening through exercise has been explained by Ryder, who shows that the mechanical action involving backward-pressure is precisely the opposite of that which has occurred to the carnivora, where the pressure has always been forward owing to the development of the canines.

The direct evidence in favor of the kinetogenetic mode of evolution is greatly strengthened by the discovery of Ameghino in the Tertiary beds of the Argentine republic of one-toed ungulates with two splint bones, and with teeth strikingly like those of the horse, though the animal belongs to a quite different order. The similarity or divergence in shape of the parts is due to the action of similar mechanical conditions in two quite unrelated groups. The same results of strains involved in digging are seen in the fore legs of the fossorial edentates, in the mole, as well as in the mole cricket. Thus as Cope concludes, «in biologic evolution, as in ordinary mechanics, identical causes produce identical results." ALPHEUS S. PACKARD,

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Kine'tograph, a machine, invented by Thos. A. Edison, for taking pictures of moving objects in their changing positions. By means of peculiar mechanism a series of photographs, about 40 to the second, can be taken. So rapidly does this machine work that every motion of a dancer's feet, every twist or turn of an athlete's wrists and arms are reproduced. The impressions are taken on a long strip of gelatine film with such rapidity and accuracy that not the faintest motion is missed.

Kine'topho'nograph, an electro-photographic apparatus combining the principles of the kinetograph, the vitascope, and the phonograph, invented by Thomas A. Edison. It is a combination of electricity and photography. A man can sit in his own parlor and see reproduced on a screen the forms of the players in an opera produced on a distant stage, and, as he sees their movements, he will hear the sound of their voices as they talk or sing or laugh.

Kine'toscope, an apparatus invented by Thomas A. Edison for exhibiting the pictures taken by the kinetograph. The kinetoscope displays the pictures to the eye, one after another, so rapidly that they all seem like one scene, with the figures moving about as they do in actual life. Also an instrument invented by Perigal, for illustrating the result of the combination of circular movements of different radii in the production of curves.

The Smithsonian Institution, in Washington, has afforded an excellent example of accelerated speed in its use of the kinetoscope in studying the growth of a plant. Kinetoscopic pictures were taken steadily and systematically as the plant grew; a delicate piece of work which required several months before the film was complete, and involved the use of an automatic flash-light and other contrivances in order that the hourly growth of the plant could be observed from first to last. When the film was finished, however, it could be run through the kinetoscope as fast as the operator wished. As a result the plant could be seen, in the compass of a few minutes, actually growing from seed to maturity, each stage of growth being in the same proportion to all others as in the original development of the plant itself.

King, Albert Freeman Africanus, American physician: b. England 18 Jan. 1841. He was graduated in medicine from Columbian University in 1861, and from the University of Pennsylvania in 1865, was appointed a professor in the medical department of Columbian and later in that of the University of Vermont, and held various posts in professional organizations. He became best known as an advocate of the theory of the transmission of malaria by the mosquito, now generally accepted by experts. He published a ‹Manual of Obstetrics› (1882; 8th ed. 1900).

King, Anna Eichberg. See LANE, ANNA EICHBERG KING.

King, Basil. See KING, WILLIAM BASIL.

King, Charles, American journalist, president of Columbia College: b. New York 16 March 1789; d. Frascati, Italy, 27 Sept. 1867. He was the second son of Rufus King (q.v.), and during the residence of his father as American minister at St. James he was sent with his brother to Harrow school. Upon the breaking out of hostilities with Great Britain, King, though a Federalist, deemed it right that the war should be prosecuted to an honorable and successful result; and as a member of the legislature of his native State in 1813, and as a volunteer in the autumn of 1814, he acted upon those sentiments. In 1823 he became associated with Johnston Verplanck in the publication of the ‹New York American,› a conservative newspaper, of much political influence and a high literary character, until 1827, when Verplanck retired and Mr. King continued sole editor. After its publication was discontinued Mr. King was associated in the conduct of the New York ‹Courier and Enquirer› 1845–9, when he was chosen president of Columbia College, which office he occupied until 1864.

King, Charles, American soldier and novelist: b. Albany, N. Y., 12 Oct. 1844. He was graduated from West Point in 1866 and was in active service in the United States army till his resignation in 1879. In the war with Spain he was a brigadier-general of volunteers and later served in the Philippines under Gen. Lawton. In 1901 he became commandant at Orchard Lake Military Academy. He has published a long series of popular novels treating of army and frontier life and people, among the best of which are: ‹The Colonel's Daughter› (1883); ‹Kitty's Conquest› (1884); ‹Captain Close and Sergeant Crœus› (1895); and also ‹Campaigning with Crook› (1890); ‹Trials of a Staff Officer› (1901); and lately, ‹The Medal of Honor› (1904).

King, Clarence, American geologist: b. Newport, R. I., 6 Jan. 1842; d. Phœnix, Ariz., 24 Dec. 1901. He was graduated from the Sheffield Scientific School of Yale University in 1862, in 1863–6 was a member of the California geological survey under the direction of Prof. J. D. Whitney (q.v.), discovered Mounts Whitney and Tyndall, the highest group in California, and with J. T. Gardiner executed the first survey of the Yosemite Valley. In 1866 he originated the plan for a survey of the western Cordilleran region at its widest point. This plan was finally sanctioned by the government and under the auspices of the army engineering department and King's direction, was executed as the «survey of the 40th parallel» and completed in 1872. The survey has been characterized as a «signal contribution to the material of science.» The volume on ‹Systematic Geology› (1878), the first of six constituting the report, was written by King and has been highly esteemed. In 1872 certain swindlers sowed a tract in Arizona broadcast with rough gems; the discovery of valuable diamond fields was announced, and companies were organized for the exploration of the find. The «fields» proved to be within the official limits of the 40th parallel survey, and were thereupon examined by King, who detected and proclaimed the fraud. In 1878 King organized the various surveys then active into the United States Geological Survey under the general direction of the secretary of the interior, and was appointed director of the survey. He resigned in 1881, attained a large practice as a mining expert, and undertook an uncompleted series of experiments to determine the action of the primal constituents of the earth under the conditions assumed as existing at the time of its separation from the sun. Partial results were published by him in Silliman's ‹Journal› (January 1893) in an article on ‹The Age of the Earth.› He wrote also, ‹Mountaineering in the Sierra Nevada› (1871), a description of his explorations, and a work of literary as well as scientific value.

King, Edward, American writer: b. Middlefield, Mass., 31 July 1848; d. Brooklyn, N. Y., 27 March 1896. He lived in Paris 20 years as correspondent of American journals. Among his works were: ‘My Paris, or French Character Sketches’ (1868); ‘Kentucky's Love, or Roughing It Around Paris’ (1872); ‘The Great South’ (1875); ‘The Golden Spike’ (1886); ‘A Venetian Lover’ (1887), a poem; ‘The Gentle Savage’ (1888), a popular novel.

King, Grace Elizabeth, American writer: b. New Orleans 1852. She was educated in New Orleans, contributed much to periodicals, and published in the ‘New Princeton Review’ in 1886–8 Creole sketches which won considerable reputation and constituted the story ‘Monsieur Motte’ (1888). Among her further works are: ‘Tales of Time and Place’ (1888); ‘Earthlings’ (1889); ‘Chevalier Alain de Triton’ (1889); ‘Jean Baptiste Lemoine, Founder of New Orleans’ (1892); ‘Balcony Stories’ (1893); ‘New Orleans: The Place and the People’ (1896); and ‘De Soto and his Men in the Land of Florida’ (1898).

King, Henry Churchill, American theologian: b. Hillsdale, Mich., 18 Sept. 1858. He was graduated from Oberlin in 1879, from the Oberlin Theological Seminary in 1882, studied also at Harvard and Berlin, was associate professor of mathematics at Oberlin in 1884–90, associate professor of philosophy in 1890–1, and professor of philosophy in 1891–7. In 1897 he was appointed professor of theology, and in 1902 president. In 1893 he was a member of the National Educational Association's committee of ten. His works are ‘Outline of Erdmann's History of Philosophy’ (1892); ‘Outline of the Microcosmus of Hermann Lotze’ (1895); ‘The Appeal of the Child’ (1900); and ‘Reconstruction of Theology’ (1901).

King, Horatio, American statesman: b. Paris, Maine, 21 June 1811; d. Washington, D. C., 20 May 1897. He learned the printer's trade and published ‘The Jeffersonian’ in his native town, and subsequently in Portland, 1831–8. The next year he was appointed clerk in the post-office department in Washington; became first assistant postmaster-general in 1854; was postmaster-general January–March 1861; and was the first man in public office to deny the power of a State to withdraw from the Union. He published: ‘An Oration before the Union Literary Society of Washington’ (1841); ‘Sketches of Travel; or Twelve Months in Europe’ (1878).

King, John, American eclectic physician and author: b. near New York city, 1 Jan. 1813; d. North Bend, Ohio, 19 June 1893. Received a liberal education and graduated in medicine at the Reformed Medical College of the City of New York, in 1838, under the celebrated Dr. Wooster Beach. In 1848, he was the first secretary of the National Eclectic Medical Association, and, in 1878, president of that body as reorganized in 1870. From 1849 to 1851 he was professor of materia medica, therapeutics and medical jurisprudence in the Memphis Medical Institute at Memphis, Tenn., from 1851 to 1856 and 1859 to 1890, professor of obstetrics and diseases of women and children in the Eclectic Medical Institute of Cincinnati, Ohio. From 1856 to 1859 he taught obstetrics in the Cincinnati College of Eclectic Medicine and Surgery. Dr. King discovered the resins of podophyllum (podophyllin) and macrotys, and the oleo-resins of capsicum and iris. He wrote: ‘Urological Dictionary,’ ‘American Dispensatory’ (1853); ‘American Obstetrics’ (1855); ‘Women: Their Diseases and Treatment’ (1858); ‘The Microscopist's Companion’ (1859); ‘The American Family Physician’ (1860); ‘Chronic Diseases’ (1866), and the ‘Coming Freeman’ (1886), the last named in behalf of the laboring classes and dedicated to the Knights of Labor. He is regarded as the father of American Materia Medica.

King, John Alsop, American politician: b. New York city 1788; d. 1867. He was the son of Rufus King (q.v.); was educated at Harrow, England, then returned to New York to study law, and was admitted to the bar. In 1812 he served as lieutenant of cavalry, was elected to the State assembly in 1819, and several times re-elected till 1823, when he was elected to the Senate. Though an opponent of Clinton, he strongly favored the building of the Erie Canal. In 1825 he went with his father to England as secretary of the legation, and on his father's return to the United States on account of ill health, he remained as *chargé d'affaires.* In 1838 he was again a member of the New York legislature for several terms; and in 1849 he was elected to Congress as a Whig and there opposed all compromise measures, especially the Fugitive Slave Law. He was one of those active in the founding of the Republican party, presided at the Syracuse convention of 1855; and was a delegate to the Philadelphia convention of 1856. In 1857 he became governor of New York State and in that office gave special attention to educational matters and internal improvements; he declined a renomination in 1860. He was one of the presidential electors in 1860, voting for Lincoln, and in 1861 was a member of the Peace Convention.

King, John Crookshanks, American sculptor: b. Kilwinning, Ayrshire, Scotland, 11 Oct. 1806; d. 18—. He was educated as a practical machinist, and emigrating to the United States in 1829 was employed for several years in Cincinnati and Louisville as superintendent of a factory. In 1834, at the suggestion of Hiram Powers, he made a model in clay of the head of his wife, and the success with which the work was accomplished encouraged him to adopt the profession of a sculptor. From 1837 to 1840 he resided in New Orleans, and modeled a number of busts of public men and made cameo likenesses, but subsequently removed to Boston. He executed several busts of Daniel Webster, also busts of John Quincy Adams, Agassiz, Ralph Waldo Emerson, and other Americans.

King, Rufus, American statesman: b. Scarboro, Maine, 24 March 1755; d. Jamaica, L. I., 29 April 1827. He was graduated from Harvard in 1777 and admitted to the bar in 1778. In 1782 he entered the Massachusetts legislature, and Congress in 1784. He took an active part in convention which framed the Federal Constitution, and removing to New York in 1788 became a Senator from that State the next year, serving 1789–96. He was United States minister to Great Britain 1796–1803, and after some years spent in partial retirement was sent for the third time to the Senate in 1813, and won renown as an orator by the brilliant speech he made on the burning of Washington by the

British. In 1819 he was again elected to the Senate, serving till 1825, when he was appointed the second time minister to the court of St. James. He was the Federalist candidate for the vice-presidency in 1804 and 1808. In collaboration with Hamilton, he wrote the 'Camillus Letters.'

King, Rufus, American journalist and soldier: b. New York 26 Jan. 1814; d. there 13 Oct. 1876. He was graduated from West Point in 1833, entered the engineer corps, resigned from the army in 1836, became assistant engineer of the New York & Erie Railway, and was adjutant-general of New York State 1839-43. He was associate editor of the Albany *Evening Journal,* and in 1841-5 editor of the Albany *Advertiser.* Having then removed to Wisconsin, he was editor of the Milwaukee *Sentinel and Gazette* in 1845-61, and in 1847-8 a member of the State constitutional convention. In May 1861 he was commissioned brigadier-general of Wisconsin volunteers. He commanded the 1st division of the 3d army corps in the department of the Rappahannock in March-August 1862, was a member of the court-martial for the trial of Maj.-Gen. Fitz-John Porter (1862-3), resigned 20 Oct. 1863, and was minister at Rome in 1863-7. In 1867-9 he was deputy customs collector of New York port. He was a son of Charles King (q.v. 1789-1867).

King, Stanton Henry, American sailors' missionary: b. Paynes Bay, Barbados, 1 May 1867. He went to sea at 12 years old and in his books 'Dog Watches at Sea' (1900); and 'A Bunch of Rope Yarns' (1902); he has related many of his personal experiences. He became superintendent of the Sailors' Haven, Charlestown, Boston, Mass., in 1898.

King, Thomas Starr, American Unitarian clergyman and lecturer, generally known as Starr King: b. New York 17 Dec. 1824; d. San Francisco 4 March 1864. He was a clerk in a dry goods store at Charlestown, Mass., in 1836-40, a teacher at Boston and Medford in 1840-2, studied theology with Hosea Ballou at Medford, preached for a time to a Universalist congregation of Boston, and in 1846-8 was pastor of the Universalist Church at Charlestown. In 1848-60 he was pastor of the Hollis Street Unitarian Church of Boston, and during this period gained great popularity as a lyceum lecturer in the northern States. Best-known was his 'Substance and Show': but other familiar subjects were 'Goethe,' 'Sight and Insight,' 'The Laws of Disorder,' 'Socrates.' He became pastor of the First Unitarian Society of San Francisco in 1860; was among the first, by newspaper article and lecture, to call attention to the Yosemite Valley; and when, in the presidential campaign of 1860, the idea of the establishment of California as an independent Pacific republic was discussed, denounced the project from the lecture platform and preserved the State to the Union. During the Civil War he was active in obtaining in California large and necessary funds for the Sanitary Commission. His name was at one time associated with the White Mountains, which he thoroughly explored, and which became known chiefly through his writings, particularly 'The White Hills: Their Legends, Landscape, and Poetry' (1859; new ed. 1887). A memorial to him was set up in Golden Gate Park, San Francisco, Cal., in 1889. King was one of the leading figures of the American lyceum in the most flourishing days of that institution. 'Patriotism, and other Papers' appeared posthumously (1865); as did the sermon 'Christianity and Humanity' (1877), with a memoir by E. P. Whipple, and the collection of lectures, 'Substance and Show' (1877). Consult also: Frothingham, 'A Tribute to Thomas Starr King' (1865).

King, William, American politician, first governor of the State of Maine: b. Scarboro, Maine, 1768; d. Bath, Maine, 17 June 1852. He was, during the greater part of his life, the last 50 years of which were passed in Bath, an active and successful merchant, but is better known by his public services in his native State. At an early period of his career he became a member of the Massachusetts legislature, and in that capacity was distinguished by his efforts in behalf of religious freedom, and of securing to original settlers upon wild lands the benefit of their improvements. He was an early and ardent advocate of the separation of Maine from Massachusetts, and upon the consummation of that act presided over the convention which met in 1819 to frame the constitution of the new State. He was subsequently elected the first governor of Maine, and, after holding office a little more than a year, became one of the United States commissioners for the adjustment of Spanish claims. He also held other offices of importance under the general and State governments, including that of collector of the port of Bath.

King, William Basil, American Episcopal clergyman and novelist: b. Charlottetown, P. E. I., 1857. After taking orders in the Episcopal Church he was for some years rector of St. Luke's Church, Halifax, N. S., and from 1871 to 1899 was rector of Christ Church, Cambridge, Mass. He is the author of 'Griselda' (1899); 'Let Not Man Put Asunder' (1902); etc.

King, William Rufus, American statesman, 13th Vice-President of the United States: b. Sampson County, N. C., 6 April 1786; d. in Dallas County, Ala., 17 April 1853. He entered the University of North Carolina at 12, and was graduated in 1803. He then commenced the study of law and was admitted to the bar in 1806. In 1806 he was elected to the legislature from his native county, and again in 1809. In 1810 he was elected to Congress, and was twice re-elected. In Congress he united himself with Clay, Calhoun, and others, who advocated the war policy of Mr. Madison's administration, and voted for the declaration of war in June 1812. In the spring of 1816 he resigned his seat to become secretary of legation to Naples under William Pinckney. The latter was afterward transferred to St. Petersburg, and was accompanied to that court also by King as secretary. Having removed to Alabama, he was elected in 1819 one of the United States senators from the new State, and was successively re-elected in 1823, 1828, 1834, and 1840. In April 1844, he was appointed minister to France. The proposition for the annexation of Texas was then pending. England was known to be decidedly opposed to the scheme, and there was a general belief that her government was urging France to join in a protest against it. King was an active advocate of the annexation, and upon reaching Paris directed his efforts to prevent this joint protest, in which he was successful. He returned to the United States in November 1846. In 1848 Senator Arthur P. Bagby was sent as minister to Russia, and King was appointed to fill the vacancy thus created. In 1849, the term for which he was appointed having expired, he was elected for a full term of six years. In 1850, on the accession of Vice-President Fillmore to the presidency, King was unanimously elected president of the Senate. In 1852 he was elected Vice-President of the United States, at the time Franklin Pierce was elected President.

King, a person vested with supreme power in a foreign state, territory or nation. According to feudal usages the king was the source from which all command, honor and authority flowed; and he delegated to his followers the power by which they exercise subordinate rule or authority. There is now no very clearly marked distinction between a king and an emperor. A queen-regent, or a princess who has inherited the sovereign power in countries where female succession to the throne is recognized, possesses all the political rights of a king.

King-at-arms, an officer of great antiquity, whose business it is to direct the heralds, preside at their chapters, and have the jurisdiction of armory. There are three kings-at-arms in England, Garter, Clarencieux and Norroy. The first is called the principal king-at-arms, the other two provincial kings-at-arms.

King Charles Spaniel. See DOG; SPANIEL.

King Conch, the great wing-shells of the genus *Strombus*, especially *S. gigas* of the West Indies and *S. pugilis* of Florida. The large helmet-shells (*Cassis*) of the same region are often called «queen conchs.»

King Cotton, a popular name given the cotton plant in the United States. «Cotton is king» was a frequent declaration before the Civil War, when the supremacy of cotton in commerce and politics was strongly asserted by public men, especially in the South.

King-crab. See HORSEFOOT CRAB.

King-crow. See DRONGO.

King-dory, a bird-dealers' name for the Australian parrots of the genus *Aspromictus*.

King Duck, the spectacled eider. See EIDER DUCK.

King George's Sound, an inlet in western Australia; five miles broad; it is an excellent roadstead, and contains two landlocked recesses, Princess Royal and Oyster Harbors. Albany, on Princess Royal Harbor, is a port of call for mail steamers.

King George's War, a war of Great Britain and its American colonies, against France and its Indian allies (1743–8), so named from King George II. See COLONIAL WARS.

King Henry the Fourth, a historical play by Shakespeare in two five-act parts. Part I., published in 1598, stands at the head of all of Shakespeare's historical comedies. Part II. forms a dramatic whole with the preceding. It was published in 1600.

King Henry the Fifth, a historical drama by Shakespeare, first printed in 1600, the materials being derived from Holinshed and an earlier drama play on the same subject.

King Henry the Sixth, a historical drama by Shakespeare in three five-act parts. Of the eight closely-linked Shakespearian historical plays, these three are the last but one. The eight cover nearly all of the 15th century in this order: 'Richard II.'; 'Henry IV.,' parts i. and ii.; 'Henry V.'; 'Henry VI.' (three parts); and 'Richard III.'. The three parts of 'Henry VI.,' like 'Richard II.,' present a picture of a king too weak-willed to properly defend the dignity of the throne.

King Henry the Eighth, a historical drama by Shakespeare, based on Edward Hall's 'Union of the Families of Lancaster and York,' Holinshed's 'Chronicles,' and Fox's 'Acts and Monuments of the Church.' The action covers a period of sixteen years, from the Field of the Cloth of Gold, in 1520, to the death of Queen Katharine in 1536.

King John, a drama based upon an older play published in 1591. The date of the action is 1200 A.D. John is on the throne of England, but without right; his brother, Richard the Lion-Hearted, had made his nephew Arthur of Bretagne his heir. Arthur, a lad of 14, is the pride of his mother Constance. The maternal affection and the sorrows of this lady form a central feature of the drama. Arthur's father, Geoffrey, has long been dead, but his mother has enlisted in his behalf the kings of Austria and of France. Their forces engage King John's army under the walls of Angiers. While the day is still undecided, peace is made, and a match formed between Lewis, dauphin of France, and John's niece Blanche. The young couple are scarcely married when the pope's legate causes the league to be broken. The armies again clash, and John is victorious, and carries off Prince Arthur to England, where he is confined in a castle and confided to one Hubert. John secretly gives a written warrant to Hubert to put him to death. The scene in which the executioners appear with red-hot irons to put out the boy's eyes, and his innocent prattle with Hubert is one of the most famous and pathetic in all the Shakespearian historical dramas. Hubert relents; but the frightened boy disguises himself as a sailor lad, and leaping down from the walls of the castle, is killed. Many of the powerful lords of England are so infuriated that they join the Dauphin, who has landed to claim England's crown in the name of his wife. King John meets him on the battlefield, but is taken ill, and forced to retire to Swinstead Abbey. He has been poisoned by a monk, and dies in the orchard of the abbey in great agony.

King Lear, by Shakespeare. See LEAR.

King-monkey, a monkey of the African semnopithecine genus *Colobus*, of which there are several species, one of which is the guereza (q.v.).

King-nut, the shag-bark hickory (q.v.).

King Penguin. See PENGUIN.

King Philip's War. See COLONIAL WARS IN AMERICA.

King Rail. See RAIL.

King Salmon or **Quinnat**, the most important of the several species of salmon found on the Pacific coast of the United States; called also Chinook or Columbia River salmon (*Oncorhynchus tschawytscha*). It is especially abundant in the Columbia and Sacramento rivers, and its great economic importance is due to the fact that it enters the rivers in large numbers in the spring. See Salmon of the Pacific.

King Snake, a large colubrine snake of the southern part of the United States (*Osceola doliata,* of which the northern house-snake is a variety), so called on account of the belief in its power and prowess, especially in overcoming rattlesnakes. It is grayish white, marked by a series of black rings in a manner so variable that many color-varieties have been named. It sometimes reaches a length of ten feet, is extremely muscular and swift, and preys upon frogs, toads and upon snakes, including poisonous ones. Hence this serpent is much respected and rarely killed in the less settled parts of the Southern States. Several other species are known, one of which (*O. coccinea*) is red with black bands, and called the red king snake. These snakes are reproduced by eggs buried in sandy soil or loose dust, like that of a rotting stump. The chain-snakes (q.v.) of the allied genus *Ophiobolus* have an equal right to the name «king snake,» and frequently receive it. Consult: Holbrook, ‹North American Herpetology,› Vol. III. (142).

King Vulture. See Condor.

King William's War, a war waged by Great Britain and its colonies in America against France and its Indian allies in 1689–1697. See Colonial Wars.

King of the Herrings, a fanciful name applied to various sea-fishes. One so called is the moonfish (*Lampris luna*). Another is the rare deep-sea ribbon-fish (*Trachypterus arcticus*) of the North Atlantic. A species of the same family (*Trachypteridæ*) occurs occasionally on the northwestern American coast, and was called by the Indians about the Straits of Fuca ‹King of the Salmon,› in reference to their belief that the killing of this fish would be followed by a failure of the salmon supply.

King of the Mackerels, a strange oceanic fish of the genus *Ranzania,* allied to the ocean sunfish (*Mola*), various species of which are superstitiously so called in various parts of the world. One kind (*R. truncata*) is now and then taken in the North Atlantic; and a Hawaiian and Japanese species is *R. makua.* Consult Goode and Bean, ‹Oceanic Ichthyology› (1895).

King of the Mullets. See Cardinal-fish.

King of the Salmon. See King of the Herrings.

Kingbird, one of the most familiar representatives in the United States of the tyrant flycatchers (*Tyrannidæ*). The typical genus is distinguished by the concealed flame-colored crest, attenuate outer primaries and square tail, and contains many species. The eastern kingbird (*Tyrannus carolinensis*) is found throughout the United States, but rarely in the Southwest or west of the Rocky Mountains; it also enters the British provinces and breeds throughout this range; in winter it migrates into Mexico, Central and South America. It is a plain little bird about eight inches long, nearly black above and quite so on the head, this color there contrasting greatly with the brilliant flame color of the crest, which can be concealed or erected at will; the tail is tipped with white, and the under parts are wholly white. The young lack the highly colored crown. The most distinctive trait of the kingbird is pugnacity, and during the nesting season no bird may come near its home without being attacked and almost invariably routed. Even crows, hawks, and eagles fly before its fearless and vigorous onslaughts. On account of the large gape of the mouth, the spreading bristles at its sides, and the flat, broad bill, the kingbird, in common with related species, is an adept in capturing flying insects, which constitute its almost exclusive food. In some localities it is known as the bee-martin, and has gained a bad reputation as a destroyer of honey-bees, but it destroys a thousand noxious insects for every bee it eats. The nest is a bulky structure saddled in a conspicuous position on a limb or fork usually of an apple-tree, and the eggs are usually rosy white, boldly spotted with brown and lilac. Two additional species of kingbirds are found in the West and two in the South. Consult: Wilson, ‹American Ornithology› (1834); Baird, Brewer and Ridgway, ‹History of North American Birds› (1874); Coues, ‹Birds of the Northwest (1874).

Kingfish, the name of verious fishes of notable power or superior excellence; especially certain «Spanish mackerels» of the genus *Scomberomorus.* One, the cavalla or «King cero» is a favorite game fish in Florida (see Cero). The kingfish of New York waters (*Menticirrhus saxatilis*) is one of the whitings, of the family *Sciænidæ,* closely allied to the drums (see Whiting). It is a moderately large migratory marine fish, «dusky gray above, sometimes blackish, the back and sides with distinct dark oblique cross-bands running down and forward,» and a V-shaped blotch on each side of the nape. It is also known as «sea-mink,» and is an excellent food-fish, but has become rare, although formerly ascending the Hudson River in schools, in early spring, for 40 miles or so. Other fishes so called are the little roncador (q.v.) of California, and the opah (q.v.). Consult: Jordan and Evermann, ‹American Food and Game Fishes› (New York, 1902).

Kingfisher, a bird of the family *Alcedinidæ,* characterized by the short, compact body and large head, with a large, straight, acute bill; the somewhat usually short, square tail of twelve rectrices, the short rounded wings having ten primary quills; the short, weak legs and nearly unique cohesion of the middle and outer toes. Two sub-families are commonly recognized, the *Daceloninæ,* or «Kinghunters,» with a broader, depressed, sometimes curved bill and usually insectivorous habits; and the *Alcedinidæ,* or true kingfishers, with a compressed, carinated bill, and usually piscivorous. About twenty genera and 125 species have been described, half of which are confined to the Australian region. About five genera and 50 species are distributed between tropical Africa and Asia, one species alone, the brilliantly colored *Alcedo ispida,* is found in Europe; while all of America has only eight species of *Ceryle,* three of which extend their range into the United States. Of these three, two (*Ceryle* *torquata* and *C. americana*), are really Mexican and Central American, but the third, the belted kingfisher (*C. Alcyon*), is a widely distributed and highly characteristic member of the North American avifauna. Throughout North America, from the shores of the Arctic Ocean to the Gulf of Mexico, and from the Atlantic to the Pacific, is the summer breeding-home of the belted kingfisher, which in winter retreats south of the limit of freezing. The large, crested head, very large bill, and deep blue color, with black and white markings and largely white under parts, give to this bird a very characteristic aspect, which is heightened by its peculiar habits. Each pair selects a hunting-ground somewhere in the vicinity of water, and other pairs seldom intrude upon this preserve. There the kingfisher perches on a tree overhanging the water and watches for the passage of a fish, when it plunges headlong and usually emerges with a small fish held firmly in the beak. As it rises a spasmodic shake dispels the water from its compact oily plumage, and on returning to its perch, the fish is usually tossed into the air and swallowed head first. Sometimes the kingfisher hunts more in the manner of a tern and plunges from a suspended position in mid-air. The only call is a peculiarly loud, harsh, rattling cry. A burrow six to nine feet long, dug horizontally into a bank, serves as a nesting place, in the slightly enlarged end of which the six or eight pure white eggs are laid on a bed of regurgitated fish bones.

The dacelonine kingfishers have very different habits, and might more properly be called king-hunters. They are usually woodland birds, caring little for the neighborhood of water, since their food consists of insects caught mainly on the wing, or else of tree-frogs, lizards and other small reptiles found on the ground or about trees. The jackass kingfisher (q.v.) of Australia is a prominent example. A peculiar group of the Papuan Islands (genus *Tanysiptera*) has long, racket-shaped tail-feathers and other peculiarities of plumage. The small East Indian species of *Ceyx* have only three toes. Those of Africa are inhabitants of deep woods, but when hard pressed for food will resort to streams and pick up small fishes. All these breed in holes in trees and not in earth-burrows.

Consult: Sharpe, ‘Monograph of the Alcedinidæ’; Evans, ‘Birds’ (Cambridge Natural History, Vol. IX.); and American and European ornithologies.

Kinghunter, a kingfisher of the sub-family *Daceloninæ;* specifically the jackass kingfisher (q.v.).

Kinglake, Alexander William, English historian: b. Taunton, Somerset, 5 Aug. 1809; d. 2 Jan. 1891. He was educated at Eton and Cambridge, was called to the bar in 1837, but ceased to practise in 1856. He represented Bridgewater in the Liberal interest in Parliament from 1857 to 1868, when Bridgewater was disfranchised. His distinction as a writer rests upon two books: ‘Eothen, or Traces of Travel Brought Home From the East’ (1844); and ‘The Invasion of the Crimea,’ in eight volumes, (1863–87). The former is marked by truth to nature, poetry, humor, and imagination; the latter (which is partly the result of personal observation) is an equally brilliant performance in its own way, almost exhaustive in its details, picturesque and telling in description and narrative, but open to the charge of prejudice in some points, his great dislike of Napoleon III. frequently appearing. Consult: Tuckwell, ‘Alexander William Kinglake’ (1901).

Kinglet, a very small bird of the thrush family dwelling in northern forests and visiting southern Europe and the United States only in winter. These smallest of songsters, hardly more than 4 inches in total length, are olive-green and gray in color, with a half-concealed yellow crest in one of the two species, the gold-crest (*Regulus Satrapa*), and a flame-colored one in the other (*R. calendula*), called ruby-crown. These tiny birds go about in small lively flocks, and have no hesitation in attacking a crow, jay or hawk with the spiteful fury that long ago won them the name «kinglet» among European peasants. Both, especially the ruby-crown, sing sweetly in the spring before going to some mountain-top or northern forest to make their cup-like nests in some evergreen tree. See GOLD-CREST.

King's Bench, Court of. See COURT.

Kings, Books of, I. and II., canonical books of the Old Testament, forming one book in the Hebrew canon. In the Septuagint version there are various omissions, additions, transpositions, and glosses, which do not in general appear to rest on any authentic authority, and sometimes bear evident traces of later invention. Besides their internal unity the books of Kings are closely connected with those which precede them in the canon, I. and II. Samuel, and even Judges and Ruth, so that some authorities suppose the whole of these books to be a single compilation. Taking the books of Kings alone there is internal evidence throughout that their compilation was subsequent to the destruction of the Jewish monarchy, and in the later chapters much to corroborate the Jewish tradition that Jeremiah, with whose book of prophecies they present many points of agreement, was the compiler. By whomsoever they were compiled, these books, as well as Judges, Ruth and Samuel, are evidently taken from a series of contemporary authorities, being, as shown by citation, the official annals as well as the prophetical writers of the successive periods. These authorities are often followed so literally that when a comment is introduced it is uncertain whether it is that of the original writer or of the compiler; thus the expression which frequently occurs in reference to memorials of occurrences that they remain to this day sometimes implies the existence of the monarchy, the temple, or something else known not to exist in the time of the compiler. The books of Kings thus contain authentic accounts of contemporary history during the whole period of the Jewish monarchy. They begin with the close of the reign of King David, and the history is carried down consecutively to a period subsequent to the capture of Jerusalem and the destruction of the temple, embracing, according to the received chronology, a period of upward of 400 years (1015–588 B.C.), and including the history of both the kingdoms of Judah and Israel. The facts recorded in regard to the foreign relations of these kingdoms from the conquest of Rehoboam by Shishak, king of Egypt, to the captivity in Babylon, have been remarkably confirmed by modern discoveries. The outline of events recorded in Kings is also frequently supplemented by much fuller details in the prophetic books, particularly Isaiah and Jeremiah. The text of the books of Kings is not considered by critics to be very pure. The chronology is in a very unsatisfactory state, being difficult to reconcile with other authorities, and in many passages inconsistent with itself. The books of Kings differ from the Chronicles in comprising the history of the separate kingdoms of Israel and Judah, while the Chronicles are occupied almost exclusively with that of Judah. It is also to be observed that the Kings contain much fuller notices of the contemporary prophets, while the Chronicles are more full in describing the temple worship and the ceremonials of the Levitical law. This may, perhaps, be regarded as confirming the hypothesis which ascribes the authorship of the former to Jeremiah the prophet, while the reputed author of the Chronicles was Ezra the priest.

King's Chapel, a religious edifice in Tremont Street, Boston, Mass., built in 1745 on the site of an older church. During the War of the Revolution it was for a time forsaken by its loyalist congregation. In the burial ground adjoining which has been in use since 1630, many of the early Puritans, including Gov. Winthrop, are interred.

King's College, a college of Cambridge University, England, founded by Henry VI. in 1441, as the College of Saint Nicholas, with Eton College as a preparatory school. Exemption from the jurisdiction of the Archbishop of Canterbury, the Bishop of Ely, and even of the University in matters scholastic, were some of its unusual privileges, and until 1857 members of King's College could take a degree without passing the University examinations, a course which did not conduce to a high standard of scholarship. In its roll of celebrated alumni are Archbishop Sumner, Bishop Pearson, Richard Croke, the Greek scholar, the first Sir William Temple, Sir Robert Walpole, and Lord Stratford de Redcliffe. The college had in 1902 a provost, 46 fellows, 48 scholars, 120 undergraduates. The college chapel is the finest in the world in size, form and decoration. It contains some of the best glass and wood carving examples in England.

King's College, London, a college established by private subscription and incorporated in 1829, its constitution being amended by an act of Parliament in 1882. The buildings are adjacent to those of Somerset House. It was established for the purpose of providing an education in accordance with the principles of the Established Church. Education is imparted in the departments of theology, general literature and science, applied sciences and engineering, and medicine. The department of general literature and science is intended to prepare students for the universities, for the army, and the Indian and home civil service; and there are also special classes for civil service candidates. There is a department for women. The college possesses a library and a museum, the latter containing Babbage's calculating machine, and King George the Third's collection of philosophical instruments and mechanical models. It is now a constituent college of London University. Among its celebrated scholars are Professors Thorold Rogers and Cayley, Sir James Fitzjames Stephen, Dean Farrer, Dante Gabriel Rossetti and his brother William.

King's College, Windsor, is the oldest university in what is now the Dominion of Canada, and, with the exception of the French foundation of Laval (q.v.) at Quebec, is the oldest college. Its establishment was the work of British Loyalists, chiefly from the State of New York, after the close of the War of the Revolution. Of these about 18,000 settled in the Nova Scotia Peninsula. As early as 8 March 1783 a meeting of Loyalists was held in New York, and «A Plan of Religious and Literary Institution for the Province of Nova Scotia» was drawn up and forwarded to the colonial secretary; and when Dr. Charles Inglis, who had formerly been rector of Trinity Church, New York, was consecrated first bishop of Nova Scotia in 1787, one of his first cares was to carry the scheme into effect. First, a grant was obtained from the Provincial Legislature for an academy at Windsor. This academy (now known as the Collegiate School) was opened 1 Nov. 1788, and the following year an Act was passed for «the permanent establishment and effectual support of a college at Windsor,» and the sum of £400 sterling per annum granted toward its maintenance. Under this Act King's College was opened in 1790 in temporary quarters, and the erection of a building of wood was begun the following year.

The first president of the college was Rev. William Cochran, a graduate of Trinity College, Dublin, who had been professor of Greek and Latin in King's (now Columbia) College, New York, but who, on account of his Loyalist sympathies, resigned and came to Nova Scotia in 1788.

A royal charter, giving to King's College full university powers, was granted by George III. in 1802, and was accompanied by an imperial grant of £1,000 a year, which was continued until 1834. The board of governors under this charter was a political body, consisting of the lieutenant-governor, the bishop, and six members of the government. The task of framing statutes for the college was entrusted to a committee of three, two of whom were uncompromising Tories, and by their rigid adherence to the Oxford model in the matter of religious tests inflicted a lasting injury upon the college and almost effected its ruin. The requirement was made that all students, on matriculation, must subscribe to the Thirty-nine Articles. To this the bishop strenuously objected, and sent his protest to the archbishop of Canterbury, who was, under the charter, patron of the college. The archbishop compromised by withdrawing the test at matriculation, but requiring it of all those who were admitted to degrees. Instead of at once publishing this amendment, the governors kept the matter quiet, and Lord Dalhousie, who became governor of the province in 1816, seems not to have heard of it until after he had arranged for the establishment of another institution (Dalhousie College) (q.v.) in Halifax.

Although the religious tests were finally removed in 1829, in spite of repeated attempts to secularize it and amalgamate it with Dalhousie College, Halifax, King's College still retained its connection with the Church of Eng-

KING'S COLLEGE, WINDSOR, N. S.

1. Convocation Hall.

2. King's College.

land, and indeed the requirement that the president should be a clergyman was only abolished in 1902. Of the three King's Colleges established at Windsor, N. S., Fredericton, N. B., and Toronto, it is the only one which has maintained its original status, the others having relinquished their charters and become secularized.

In 1846 a meeting of alumni of the College was held, and it was determined to form an association for furthering the interests of the College. Accordingly a provincial act incorporating "The Alumni of King's College, Windsor," was obtained in 1847, and six years later another act abolished the old political board of governors and constituted a new board, the members of which were, for the most part, to be elected by the alumni. The provincial grant of £400 was discontinued in 1849, and for some years the smaller grant of $1,000 a year was continued, but this ceased in 1881, and since that time the College has been thrown upon its own resources. The progress of the College was rapid under the new régime. The number of students increased. A beautiful stone convocation hall and library was erected in 1861 and a chapel in 1877.

The library of the college, which owes its inception to John Inglis, who went to England in 1802 to collect books, contains some of the most valuable bibliographical treasures in Canada. There are no less than 18 volumes from the famous Aldine Press including the Aristotle of 1495–8. Then there are 20 volumes from the Elzevir Press and 16 from that of Stephens of Paris. One of the treasures is a copy of the Coberger Bible of 1475, of which there is perhaps not another copy in America. Among the valuable books of a later date may be mentioned the Boydell edition of Shakespeare and Milton, and a presentation copy of the Marquis of Buckingham's ‘Homer.’

The present teaching staff of the college consists of a president, who is also professor of English literature, history and economics, two divinity professors, one of classics, one of chemistry and geology, one of mathematics and physics, one of engineering, and one of modern languages. Degrees are given in arts, divinity, engineering, and science, and a school of law, established at Saint John, N. B., in connection with the University of King's College, in 1892, is doing good work. The Engineering School, which is the oldest in Nova Scotia, is now (1904) being removed to the Sydneys to take advantage of the splendid plant in operation in the Cape Breton metropolis. F. W. Vroom,

Registrar of the College.

Kings' Daughters and Sons, International Order of the, an organization of men, women and children of all religious denominations, whose object is to minister to the sick and needy wherever found, and to do good to all with whom they come in contact. The original circle (of women) was formed in New York in 1886, and its members are found in almost every State in the Union. There are also branches in several foreign countries. The badge is a small silver Maltese cross, generally suspended by a purple ribbon and bearing the initials "I. H. N." (In His name). The society publishes a weekly paper, ‘The Silver Cross.’ The membership in 1903 was over 500,000.

King's (or **Queen's**) **Evidence,** the British equivalent of State's evidence. See Informer.

King's Evil. See Scrofula.

King's Mountain, N. C., a village in York County, 80 miles northeast of Columbia. In the vicinity is a high hill where a battle took place 7 Oct. 1780, between the Americans, under Levier, Shelby, Campbell and William, and the British, under Ferguson. The latter were defeated with a loss of 456 killed and wounded, among whom was the commander, and 648 taken prisoners after an hour's fighting. Ferguson, shouting to his men: "Crush the damned rebels to the earth," prepared for one final charge, and fell at the head of his regulars pierced by seven bullets, dying, according to tradition, by the hand of Col. Williams, who was also slain. His men, disheartened by his fall, surrendered. The Americans lost only 20 men killed, although a large number were wounded. After the battle 10 of the prisoners notorious for their crimes were hanged, having first been regularly tried and condemned by their captors. This was one of the most brilliant victories of the war, and exercised an important influence in precipitating the downfall of British power in the South. The 75th anniversary of the battle was commemorated by a celebration on the ground.

Kings'ford, William, Canadian historian: b. London, England, 12 Dec. 1819; d. Ottawa, Ont., 29 Sept. 1898. He entered the army and came to Canada in an English regiment in 1841. He then took up surveying and engineering, and was at various times employed upon the construction of the Hudson River, Panama, Grand Trunk, and Canadian Pacific railways. He made his home in Canada and published ‘The History, Structure, and Statistics of Plank Roads in the United States and Canada’ (1851); ‘The Canals: Their History and Cost’ (1865); and ‘The History of Canada’ (1880), a well-known work; etc.

Kingsley, kingz'lĭ, **Charles,** English clergyman, novelist, and poet: b. Holne Vicarage, near Dartmouth, Devonshire, 12 June 1819; d. Eversley, Hampshire, 23 Jan. 1875. He was a pupil of Derwent Coleridge (q.v.) from whose care he passed to King's College, London, and thence to Magdalen College, Cambridge, where he was graduated with high honors in 1842. Soon after graduation he took orders in the Established Church and obtained the curacy of Eversley, and became its rector in 1844. This living he retained till his death, but he also held in succession two canonries, one in the cathedral of Chester 1869–73, and one in the chapter of Westminster from 1873 till his death. From 1860 to 1869 he was professor of modern history at Cambridge. Early in his career as a clergyman of the Church of England he associated himself with F. D. Maurice, Julius Hare, and others, both in their religious views and in their social aims. With them he considered it the peculiar duty of the Church to improve the condition of the working-classes, not only by inspiring them with Christian feeling and Christian principle, but also by encouraging and aiding them in bettering their material position. With the latter object he was a strong advocate of co-operative association. His first literary works of importance, ‘Alton Locke, Tailor and Poet’ (1850), and ‘Yeast, a Problem’ (1851), gave expression to his sentiments on social questions, and both of them, but especially the first, made a great impression when they appeared. The principal of his later novels are 'Hypatia' (1853), 'Westward Ho!' (1855), perhaps the most popular of his stories, and 'Hereward the Wake,' 'Last of the English' (1866). Other works of his are 'Glaucus, or The Wonders of the Shore'; 'Town Geology'; 'The Roman and the Teuton,' historical lectures; 'The Water Babies,' a fairy-tale of science; and 'At Last,' a visit to the West Indies. He was also the author of numerous sermons, lectures, and essays, and of various poems, the chief of which are 'The Saint's Tragedy,' and 'Andromeda,' the latter one of the most successful experiments in English hexameter. Consult: 'Letters and Memories of Charles Kingsley,' by his wife (1877).

Kingsley, Elbridge, American artist and engraver: b. Carthage, Ohio, 17 Sept. 1842. He was graduated at Hopkins Academy, Hadley, Mass., and proceeded to New York where he studied art at Cooper Union. He began engraving for the Century Company in 1878, and started the School of Painter Engraving in 1880 with original work. He is one of the artists who have been instrumental in raising the school of American engraving to the high rank in the art world which it now enjoys.

Kingsley, Florence Morse, American novelist: b. Medina, Ohio, 14 July 1859. She was educated at Wellesley College and was married in 1882 to Charles R. Kingsley. She has published 'Titus: a Comrade of the Cross' (1894); 'Stephen' (1896); 'Paul' (1897); 'Prisoners of the Sea' (1897); 'The Cross Triumphant' (1899); 'The Transfiguration of Miss Philura' (1901); 'Through a Needle's Eye' (1902); 'Wings and Fetters' (1902).

Kingsley, Henry, English novelist, brother of C. Kingsley (q.v.): b. Barnack, Northamptonshire, 1830; d. 24 May 1876. After being educated at King's College, London, and Worcester College, Oxford, he went to Australia, where he spent five years, returning to England in 1858. He was editor of the *Daily Review,* Edinburgh, 1870–1, was its war correspondent during the Franco-Prussian War, and as such was present at the battle of Sedan. In 1859 he published 'Recollections of Geoffrey Hamlyn,' a vigorous novel of Australian life, and this was succeeded by 'Ravenshoe' (1861); and 'The Hillyars and the Burtons' (1865).

Kingsley, John Sterling, American zoologist: b. Cincinnatus, N. Y., 7 April 1854. He was graduated from Williams College in 1875, was professor of zoology at the University of Indiana 1887–9; and at the University of Nebraska 1889–91, and has filled a similar position at Tufts College from 1892. He edited 'The American Naturalist' (1886–96) and has published 'Elements of Comparative Zoology'; 'Vertebrate Zoology'; 'Popular Natural History' (1890).

Kings'mill Group. See Gilbert Islands.

Kingston, kĭng'stŏn, **William Henry Giles,** English novelist: b. London 28 Feb. 1814; d. Willesden, Middlesex, 5 Aug. 1880. His youth was spent in Oporto, Portugal, and having aided in arranging a commercial treaty between England and Portugal he was knighted by the Queen of Portugal in 1842. He wrote almost though not quite exclusively for boys, producing 130 stories in 30 years; mostly of sea voyage and adventure, which were very popular.

Kingston, Canada, city, port of entry, capital of Frontenac County, in the Province of Ontario. Situated at the mouth of the Cataraqui River and at the outflow of the Saint Lawrence from Lake Ontario. At Kingston the Rideau Canal from the Ottawa River at Ottawa City, connects with the Saint Lawrence River and the system of the Great Lakes.

It is on the main line of the Grand Trunk Railway, between Montreal and Toronto, and is connected with the Canadian Pacific Railway, east, west and north, by means of the Kingston and Pembroke Railway. During the season of navigation, the Richelieu and Ontario and other lines of steamers connect it with Montreal and other points on the Saint Lawrence River, and with Rochester, Toronto, Bay of Quinte and intermediate points, in the West. Kingston is midway between Montreal and Toronto, being 170 miles to the west of the former, and 163 miles to the east of the latter.

The harbor, sheltered from Lake Ontario by Amherst, Simcoe and Wolfe islands, is considered one of the best on the lake. The fortifications of Kingston are third in importance in Canada, those of Quebec and Halifax taking precedence.

In July 1673, the site of Kingston was first visited by Frontenac, the French governor of Canada, accompanied by La Salle. There the Indians were assembled for a conference, and during his stay the governor erected a fort built of wood and surrounded by palisades. Thus originated Fort Frontenac at Cataraqui, the first fort on the lower lakes west of Montreal. In 1675, La Salle obtained from Louis XIV. a grant of Fort Frontenac and the seigniory of Cataraqui, with the adjoining islands, and two years later he partially completed a new stone fort replacing the wooden one. The fort and the mainland subsequently reverted to the French Crown, but a large part of Wolfe Island is still held by titles originally derived from La Salle. Owing to Indian incursions Fort Frontenac was abandoned and partly destroyed in 1689. In 1695, however, during Frontenac's second term as governor, the fort was rebuilt, and, until the time of the English conquest, was maintained as one of the chief French centres of authority, communication and trade for the West. From there, in 1756, Montcalm launched his successful attack upon the British post of Oswego. But in 1758 Bradstreet captured and partly destroyed Fort Frontenac.

After the British conquest of Canada, Cataraqui was practically deserted until the arrival of the Loyalist refugees during the Revolutionary War. When Carleton Island was ceded to the United States by the treaty of 1783, Cataraqui was again occupied by the British government as a military and naval station; and in 1784 it was made the centre of the Loyalist settlements in the West, the place being renamed Kingston in honor of George III. Kingston was the chief naval and military post in Upper Canada during the War of 1812–15. A new fort was constructed on Point Henry, in 1815–16, which was rebuilt in its present form in

KINGSTON, CANADA

1. Military College and City 2. The Fort

1832–6, the advance battery being added in 1842. The four martello towers which, with the fort on Point Frederick, complete the present fortifications of the city, were built between 1846 and 1848. After the convention of 1817, by which the United States and Great Britain agreed not to maintain naval establishments upon the Great Lakes, the naval depot at Kingston was given up.

Kingston was for many years the most important commercial and shipping centre in Upper Canada. There the first mill was built in 1784, the first regular newspaper established in 1810; in the neighborhood the first steamboat was built in 1816, and others soon followed.

In 1838 Kingston received the charter of a city, though still called a town. In 1841, on the reunion of the Provinces of Upper and Lower Canada, it was selected by Lord Sydenham as the capital of the new Province of Canada. In 1844 the capital was transferred to Montreal. From Kingston have come many of the leading statesmen of the Canadian Dominion, such as Sir John Macdonald, Sir Oliver Mowat, Sir Richard Cartwright, Sir Archibald Campbell and Sir George Kirkpatrick.

The city contains three large grain elevators and is an important point for the transshipment of grain coming down from the western lakes. Some of the chief manufactures of the city are locomotives, cotton, hosiery, leather, flour and cereals.

The leading educational institutions are Queen's University (q.v.), with which is affiliated the Kingston School of Mines; the Royal Military College, the Dairy School, Regiopolis College, the Kingston Business College and the Collegiate Institute. The city has a General Hospital, the Hotel Dieu Hospital, an Orphans' Home and House of Providence, while just outside the city limits are the Provincial Penitentiary and Rockwood Hospital for the Insane. The Anglican and Roman Catholic cathedrals, and the city, county and university buildings are handsome stone edifices, adding to the attractions of the city. A bronze statue of Sir John A. Macdonald stands at the main entrance to the city park, while the Sir George A. Kirkpatrick memorial fountain faces the park in front of the county buildings. Pop. (1901) 18,043.

Adam Shortt,
Queen's University, Kingston.

Kingston, Jamaica, the capital of the island. See Jamaica.

Kingston, N. Y., city, county-seat of Ulster County; on the Hudson River, and on the West Shore, the Wallkill Valley, and the Ulster & Delaware R.R.'s; and is connected by ferry with the main line of the New York Central & Hudson River railroad on the east side of the Hudson; about 100 miles north of the city of New York and 55 miles south of Albany. The Wallkill River and Rondout Creek enter the Hudson at Kingston. The first settlement was made here in 1652 by the Dutch. They named the place Esopus. In 1661 they were granted a charter, but as a dependency of Fort Orange (now Albany), the place was called Wilturick. The British obtained possession in 1664 and in 1669 they changed the name to Kingston. On 19 Feb. 1777 the first State convention of the State of New York adjourned from Fishkill to Kingston, and the first State Constitution was proclaimed in front of the court-house, on 22 April 1777. On 9 September of the same year, Chief Justice Jay opened in Kingston the first State court. The State legislature met here in September of the same year, but was dispersed by the approach of the British, who entered the place on 7 October and destroyed nearly the whole town by fire. It was rebuilt, and was incorporated as a village in 1805 and chartered as a city in 1872. The city now comprises the former villages of Kingston, Rondout, and Wilbur. The chief manufactures are bricks, motor-trucks, and Rosendale cement. It is the commercial centre for a large extent of country, and has an extensive trade in farm products, coal, cement, lime, lumber, grain, brick, and bluestone. It has the Kingston and Ulster academies, a business college, Our Lady of Victory's Sanatorium, libraries, an armory, a city-hall, court-house, and several fine churches. The bridge owned by the West Shore Railroad is about 150 feet above tidewater. The "Senate House," the first home of the New York legislature, contains a collection of relics connected with the early settlement of the country. Kingston Point Park, about 50 acres in extent, and on the Hudson, is being made more attractive each year. The large steamers now land at this park. The government of the city is vested in a mayor, who holds office two years, and a council. The executive appoints the subordinate officials, subject to approval by the council, except the city judge and the recorder, who are elected by the people. Pop. (1890) 21,261; (1900) 24,535.

Kingston, Pa., borough in Luzerne County, on the Susquehanna River, opposite Wilkes-Barre; on the Lehigh Valley and the Delaware & Lackawanna R.R.'s. Here is the seat of the Wyoming Methodist Seminary. The principal industry is coal mining. The repair shops of the Lackawanna Railroad are located here. Kingston was incorporated as a borough in 1858. In the near vicinity in 1778 occurred the famous Wyoming Massacre. Pop. (1890) 2,381; (1900) 3,846.

Kinkajou, kĭng'ka̤-joo. See Potto.

Kinney, kĭn'ĭ, **Coates,** American writer: b. Kinney's Corners, N. Y., 24 Nov. 1826. He studied law, was admitted to the bar in 1856 and subsequently edited several Ohio journals. He served in the Federal army during the Civil War, being mustered out in 1865 with brevet rank of lieutenant colonel, and sat in the Ohio Senate, 1881–2. He has published 'Keuka' (1855); 'Lyrics' (1888); 'Mists of Fire and Some Eclogues' (1899), but is best known by the familiar lyric 'Rain Upon the Roof.'

Kino, kē'nō, a kind of gum which exudes from certain trees when an incision is made, and is dried without artificial heat. The East Indian or Malabar kino comes from a leguminous tree (*Pterocarpus marsupium*); Bengal or Palas kino from *Butea frondosa;* and Australian or Botany Bay kino from *Eucalyptus rostrata*; West Indian from a third plant (*Coccoloba uvifera*). It consists of dark red angular fragments, rarely larger than a pea, and easily splitting into still smaller pieces. It is very soluble in spirits of wine, and in general behavior closely resembles catechu, and yields by similar treatment the same products. In medicine it is an astringent and tonic.

Kinsol'ving, George Herbert, American Protestant Episcopal bishop: b. Bedford County, Va., 28 April 1849. He was graduated from the Theological Seminary at Alexandria, Va., and was ordained to the priesthood in 1875. He was successively rector of churches in Baltimore, Cincinnati, and Philadelphia, and in 1892 was consecrated bishop of Texas.

Kin'ston, N. C., town, county-seat of Lenoir County; on the Neuse River, and on the Atlantic & North Carolina and the Atlantic Coast Line R.R.'s; about 78 miles southeast of Raleigh and about 60 miles from Pamlico Sound. It is situated in a fertile agricultural region in which tobacco and cotton are the chief productive crops. Kinston is an important trade centre and contains a number of large warehouses. Its chief industrial establishments are stemmeries, packing houses, cotton-mills, machine-shops, foundry, wagon works, turpentine distillery, box and barrel factories, shingle-mills, and knitting mills. It is the seat of the Rhodes Military Institute. The city owns the electric light plant. Pop. (1890) 1,726; (1900) 4,106.

Kinston, Battle of. On 1 March 1865 Gen. Cox, with three divisions of infantry, pushed forward from Newbern, N. C., toward Goldsboro to open communication with Gen. Sherman, who was marching northward from Savannah, and on the 7th two of his divisions were at Wise's Forks, near Southwest Creek, a tributary of the Neuse River, with one division three miles in rear. A brigade was advanced to a cross-road about midway between the main line and the creek. Gen. Hoke, with his Confederate division, crossed the creek on the night and early morning of the 7th and 8th, flanked, surprised, and routed the advance brigade, taking over 900 prisoners and, pressing on, fell upon the left of Cox's line, but was repulsed. He renewed the attack and was again repulsed. On the 9th there was sharp skirmishing and the Confederates made repeated efforts to turn Cox's right, which were foiled. On the morning of the 10th Hoke and D. H. Hill made vigorous and successive attacks first upon the left and then on the right of Cox's line, but were repulsed, and Gen. Bragg, who was in supreme command, made no further effort, retreated across Neuse River during the night, burning all bridges behind him, left a small guard at Kinston and, with the rest of his command, hastened through Goldsboro to join J. E. Johnston, who was concentrating everything available to oppose Sherman. Gen. Schofield joined Cox with troops from Wilmington, and reached Goldsboro on the 21st, Sherman joining him two days later. The Union loss at Kinston was 65 killed, 319 wounded, and 930 missing; the Confederate loss is not known. D. H. Hill reports a loss in five brigades of 118 killed and wounded and 16 missing. Schofield estimated the entire Confederate loss at 1,500, which is probably excessive. Consult: 'Official Records,' Vol. XLVII.; Cox, 'The March to the Sea,' and 'Military Reminiscences of the Civil War,' Vol. II.

E. A. Carman.

Kintyre, kĭn-tīr', a peninsula of Scotland, between the Firth of Clyde and the Atlantic, forming the division of Argyleshire. It is 40 miles long from the Isthmus of Tarbet to the Mull of Cantyre, and has an average breadth of about 7 miles.

Kin'zie, John, American pioneer: b. Quebec, Canada, 1763; d. Chicago, Ill., 6 Jan. 1828. His name was originally McKenzie. For a time he was a jeweler in Quebec, but later became a trader in the western United States, and in 1804 established a post on the site of the present Chicago, of which he was the earliest white settler. He also set up stations on the Illinois, Kankakee, and Rock rivers.

Kiosk', a Turkish word meaning pavilion. It has a tent-shaped roof, open on all sides and is supported by pillars, round the foot of which is a balustrade. It is built of wood, roofed with straw or similar materials, and is chiefly erected to afford a free prospect in the shade, but it also serves to embellish a rural or garden view. This kind of pavilion has been introduced from the Turks and Persians into the English, French, and German gardens.

Kioto, kē-ō'tō, or **Kyoto,** one of the great cities of Japan, and for over 1,000 years the capital; situated on a flat plain about 26 miles inland from Osaka. A high range of hills to the east separates this plain from Lake Biwa, and on these some of the finest temples connected with the city are built. The city is rectangular in form, the longer streets running north and south parallel to the Kamo River, which flows along the base of the ridge. At the north end are situated in an enclosure the plain wooden buildings where the emperors of Japan dwelt so long in seclusion. The Honganji temples of the Monto sect of Buddhists, fine structures of their kind and the centre of the Buddhist faith in Japan, rise at the south end of the city. The streets, though narrow, are clean and attractive, and the whole city has an air of refinement. The singing girls of Kioto are noted for their graceful dances. The pottery, porcelain, crapes, velvets, and brocades of Kioto are highly esteemed; its embroideries, enamels, and inlaid bronze-works are marvels of skilful handicraft. The capital was not removed from Kioto until 1868, when the Mikado and his court took up residence at Tokio (Yeddo). Pop. (1900) 353,139.

Kiowa, kĭ'o-wạ (properly käī-gwŭ), a considerable Indian tribe now in Oklahoma, whose language forms a distinct stock, who have resisted with unusual virility the physical decay so common among the tribes, and whose pictograph calendar from about 1830 is of scientific interest. In dress and dwellings they are civilized, but otherwise tenacious of their old customs; of which the most prominent were the sun dance, and devotion to a stone image called the Taimé, a sort of guardian deity. They had a military order of six degrees, and were organized in six bands; one of which, inaccurately called the Kiowa-Apache (by themselves «Nadiishañ-dina»), is an Athapascan tribe immemorially confederated with them. First living (according to their and other tribes' traditions) in the Montana Rockies along the head waters of the Missouri and Columbia, they followed the retreating buffalo herds southward along the plains, allying themselves with the Crows and assailed by the Cheyenne and Sioux; halted for a while successively in the Black Hills and along the Platte and Arkansas; at first warring with the Comanches, but since 1790 in confederacy with them, and finally making peace with the Cheyennes and Arapahoes. They became one of the most formidable scourges of the plains, harrying the frontiers of the United States and Mexico. The treaty of Medicine Lodge, Kan., in 1867, enforced (after their disobedience) by Custer's troops during the next winter, placed them, with the Comanches, Cheyennes, and Arapahoes, upon reservations in Oklahoma; they broke loose in 1874, and Mackenzie was obliged to kill their horses and deport their leaders and chief men to Florida. Thenceforth they remained on the reservation. This was thrown open to settlement in 1901, and they accepted American citizenship. Their number, about 1,100, is not very much less than at any time for a century. ‘Mooney's Calendar History of the Kiowa Indians’; ‘17th Report Bureau of American Ethnology’ 1898.

Kip, William Ingraham, American Protestant Episcopal bishop: b. New York 3 Oct. 1811; d. San Francisco, Cal., 7 April 1893. He was graduated at Yale College in 1831, entered the General Theological Seminary of the Episcopal Church in New York, and was ordained deacon in 1835. In 1838 he was called to the rectorship of St. Peter's Church, Albany, N. Y., which position he retained until his consecration in 1853 as missionary bishop of California. He published several religious treatises, including ‘The Lenten Feast’ (1843); ‘The Double Witness of the Church’ (1844); etc.; and also ‘Early Jesuit Missions in North America’ (1846); ‘Early Conflicts of Christianity’ (1850); ‘The Catacombs of Rome’ (1864); ‘Olden Times in New York’ (1872); ‘Early Days of My Episcopate’ (1892).

Kip'ling, Rudyard (originally JOSEPH RUDYARD), Anglo-Indian author: b. Bombay, India, 30 Dec. 1865. After studying at the United Services College, Westward Ho, North Devon, he returned to India in 1882 as sub-editor of the Lahore ‘Civil and Military Gazette,’ and was for some time special correspondent on the frontier, in Rajputana, and elsewhere, for that paper and for the Allahabad ‘Pioneer.’ He left India in 1889 and went to England, after visiting China, Japan, Africa, Australia, and the United States. For several years he resided at Brattleboro, Vt., but later returned to England, and lived at Rottingdean, Sussex. During the second Boer war he visited South Africa as a newspaper correspondent. He first made himself known to a restricted circle of English readers by a volume entitled ‘Departmental Ditties’ (1886), in which he dealt with the salient features of Anglo-Indian life with directness, insight, and metrical facility. An enlarged edition appeared in 1890. In ‘Plain Tales from the Hills’ (1887) he gave the public the first collection of the striking and characteristic stories of English life under Indian conditions, on which his reputation chiefly rests. It was followed by ‘The Phantom Rickshaw’ (1889), including ‘The Man Who Would be King’; ‘Soldiers Three: Stories of Barrack-Room Life’ (1890), «almost a classic in its way,» whose heroes are a kind of latter-day «Trois Mousquetaires»; ‘The Story of the Gadsbys’ (1890); ‘In Black and White’ (1890), including eight tales; ‘Wee Willie Winkie, and Other Stories’ (1890), including ‘The Drums of the Fore and Aft’ and ‘Under the Deodars’ (1890). ‘The Light that Failed’ (1891) was his first attempt at sustained fiction. ‘Life's Handicap: being Stories of Mine Own People’ (1891), contains some of his best short stories, among them ‘Without Benefit of Clergy.’ His reputation was greatly enhanced by the publication in 1892 of ‘Barrack-Room Ballads, and Other Verses,’ including such poems as ‘Fuzzy-Wuzzy’; ‘Gunga Din’; and ‘The Road to Mandalay.’ To the same year belongs the rather unsuccessful novel ‘The Naulakha: a Story of the West and East,’ written with Wolcott Balestier. ‘Many Inventions,’ published in 1893, is a collection of 14 short stories, and the Jungle Book (1894), illustrated by his father and others, is partly in verse, partly in prose. Many regard this volume, with its beast-fables of a primitive India, as Kipling's best work. A ‘Second Jungle Book’ appeared in 1895, and in 1896 a volume of poems was issued under the title ‘The Seven Seas, and Other Verses.’ ‘Captains Courageous’ (1897) is a story of the Newfoundland cod banks, and ‘The Day's Work’ (1898) is a collection of 12 short stories, including ‘The Bridge-Builders.’ Among more recent works are ‘Kim’ (1901), whose hero is an agent in Indian secret service, a book in which «the last word upon native India seems to have been said»; ‘The Just-So Stories’ (1902), a clever juvenile; and ‘The Five Nations’ (1903), a collection of somewhat uneven verse. Of Kipling's occasional poems the most famous is ‘The Recessional,’ written on the occasion of Queen Victoria's Diamond Jubilee (1897). Kipling's best work must always rank high, but he is very unequal, and at times journalistic or mediocre. At his best, however, he is skilful in character-drawing, and his word-pictures are often extremely vivid. Consult: Clemens, ‘A Ken of Kipling’ (1899); Knowles, ‘A Kipling Primer’ (1900); Le Gallienne, ‘Rudyard Kipling’ (1900); Parker, ‘The Religion of Kipling’; and many magazine articles.

Kip'per, a kippered herring, that is one preserved by smoking or pickling. Anciently in Scotland the word signified a salmon taken after the spawning season, and split, salted and dried, because of its inutility when fresh.

Kiral'fy, Imré, organizer and manager of spectacular exhibitions: b. Budapest, Hungary, 1 Jan. 1845. He commenced the composition of music at the age of 12; introduced many grand spectacular compositions in the United States 1869–94. His many productions include ‘Venice’; ‘Paris’ (1902); ‘Columbus’; ‘Nero’; ‘India’; ‘America’ (1893); ‘Our Naval Victories’ (1898); ‘Women of All Nations’ (1900); ‘China, or the Relief of the Legations’ (1901). Some of these tableaux and panoramas have had a success unexampled in the history of such undertakings.

Kirby, kėr'bĭ, **William,** Canadian author: b. Kingston-upon-Hull, England, 13 Oct. 1817. He removed to Canada in 1832, but was educated in Cincinnati, Ohio. In 1839 he removed to Niagara, Ont., where he was editor and publisher of the ‘Mail’ for 20 years, and from 1871 to 1895 collector of customs there. He published ‘U. E., a Tale of Upper Canada,’ a poem

1860); ‹Le Chien d'Or,› a novel (1877); ‹Pontiac› (1887); ‹Annals of Niagara› (1896); etc.

Kirchbach, Wolfgang, vōlf'gäng kĭrH'bäH, German critic and poet: b. London, England, 18 Sept. 1857. He was the son of a German artist and studied in Dresden and Leipsic. Settling in the former city in 1888 he was editor of the ‹Magazin für Litteratur des In und Auslandes,› but from 1896 has lived in Berlin. Among his works may be cited: ‹Märchen› (1879); ‹Salvator Rosa,› a romance (1880); ‹Gedichte› (1883); ‹Das Leben auf der Waltz› (1892); ‹Die letzten Menschen,› a drama (1892).

Kirghiz, kĭr-gēz', **Kirghis,** or **Kirghiz-Kazaks,** a widely-spread nomadic people of Asia, of Turkish-Tartar race, who inhabit the steppes that extend from the lower Volga and the Caspian Sea in the west to the Altai and Thian-Shan Mountains in the east, and from the Sea of Aral in the south to the Tobol on the north. The term Kirghiz, though applied by Europeans to the whole of these peoples, properly belongs only to the Kara-Kirghiz (Black Kirghiz, called also Burûts or Pruts). Those to whom Europeans give the name Kirghiz are called by the Asiatics Kazaks. The Kirghiz-Kazaks speak the Turkish dialect of the Uzbeks. In their physical type they belong to the Mongolian race. They profess the Mohammedan faith, though they do not practise polygamy. They are below the general average of European stature, and are remarkably healthy and vigorous. Their food is chiefly mutton and horse-flesh, with koumiss or fermented mare's milk, from which they extract an intoxicating spirit. Their dwellings consist of a hemispherical tent, the frame of which is of boughs, the covering of felt. Their manufactures are exclusively domestic, and consist of woolen cloths, felt, carpets, hair-ropes, leather, metal ornaments for horse-trappings, knives, etc. They carry on a trade by barter with the Chinese and Russians, exchanging sheep, horses, camels, cattle, wool, skins, etc., for tea, cutlery, silks, and other manufactured goods. A considerable portion of the Kirghiz dwell in Chinese territory, for the most part in Turkestan, but the greater number of them are nominally under Russian dominion. Of these European Russia contains 150,000.

Kirk, kĕrk, **Edward Norris,** American Congregational clergyman: b. New York 14 Aug. 1802; d. Boston 27 March 1874. He was graduated at Princeton (then the College of New Jersey), in 1820, studied law in New York, was graduated from the Princeton Theological Seminary in 1824, was agent for the Board of Foreign Missions in the Southern States, was ordained in 1827, in 1828–37 was pastor of the Fourth Presbyterian Church of Albany, N. Y., and there established with N. S. S. Beman a school of theology. From 1842 until his resignation in 1871 he was pastor of the Mount Vernon Congregational Church of Boston. In 1856 at the request of the American and Foreign Christian Union he inaugurated regular worship for American Protestants in Paris. He was president of the American Missionary Association, and published ‹Sermons› (1840; 1860); ‹Lectures on Christ's Parables› (1856); and other writings.

Kirk, Ellen Warner Olney, American novelist: b. Southington, Conn., 6 Nov. 1842. She was educated in Stratford, Conn., and was married to John Foster Kirk (q.v.) in 1879. Her novels have been popular, and among them are: ‹Lost in Idleness› (1877); ‹A Midsummer Madness› (1884); ‹The Story of Margaret Kent› (1886); ‹Sons and Daughters› (1887); ‹A Daughter of Eve› (1889); ‹Walford› (1890); ‹The Story of Laurence Garthe› (1895); ‹Dorothy Deane› (1899).

Kirk, John Foster, American historian: b. Frederickton, N. B., 22 March 1824. He removed to the United States in 1842 and settled in Boston, where he was for 11 years secretary to the historian Prescott, whose complete works he has edited. In 1870 he removed to Philadelphia, where he was editor of ‹Lippincott's Magazine› till 1886; and lecturer on history in the University of Pennsylvania, 1885–8. He is the author of ‹History of Charles the Bold› (1863–8); and editor of the ‹Supplement› to ‹Allibone's Dictionary of Authors› (1891).

Kirk'bride, Thomas Story, American physician: b. near Morrisville, Bucks County, Pa., 31 July 1809; d. Philadelphia 16 Dec. 1883. He received the degree of M.D. from the University of Pennsylvania in 1832, and was appointed resident physician of the Friends' lunatic asylum at Frankford, Pa. A year later he was elected resident physician of the Pennsylvania hospital, in which he continued two years, when he began general practice in Philadelphia. In January 1841 he became superintendent of the Pennsylvania Hospital for the Insane, then first opened, and continued in that office till his death. He published ‹Rules and Regulations of the Pennsylvania Hospital for the Insane› (1850), which has been a text-book and guide in the regulations of new hospitals; and a work ‹On the Construction, Organization, and General Management of Hospitals for the Insane› (1854, enlarged 1880). In 1853 he proposed the erection of a new hospital, and the separation of the sexes in two distinct buildings, and was the first superintendent in the United States to carry such an arrangement into effect.

Kirk'dale Cave, in Yorkshire, England, 28 miles west of Scarborough, is famous for the numerous remains of Tertiary mammals. It was discovered in 1821, in the cutting back of an oolitic limestone rock in which it is situated. Its greatest length is 245 feet. The fossil bones are contained in a deposit of mud that lies on the floor of the cave. The remains of the following animals have been discovered: hyena, tiger, bear, wolf, weasel, elephant, rhinoceros, hippopotamus, horse, ox, deer, hare, rabbit, water-rat, raven, pigeon, lark, and duck.

Kirke, Sɪʀ **David,** English adventurer: b. Dieppe, France, 1596; d. Ferryland, Newfoundland, 1656. The «merchant adventurers» of London were at the beginning of his life a powerful body of associated privateers, and his father, Gervase Kirke, a dealer in French wine, who had left France to escape from the perils of the religious wars, joined the adventurers and projected with Sir William Alexander a plan for capturing New France and colonizing Nova Scotia. They obtained letters of marque and a monopoly of the fur trade, and David Kirke sailed in 1627 as commodore of three privateers, his brothers, Lewis and Thomas, being each in command of one. Off Quebec, they captured 20

French ships with cargoes and passengers. In 1629 he captured another vessel and compelled Champlain to surrender Quebec. In the meantime peace had been made with France, the captured territory was restored, but Kirke was knighted for his services. He seemed doomed to disappointed ambition to the end, for Cromwell's council revoked, after the execution of Charles I., the grant of all Newfoundland made to Kirke by the king, although the adventurer eventually recovered some portion of the lands thus confiscated.

Kirk'land, Caroline Matilda Stansbury, American author: b. New York 12 Jan. 1801; d. there 6 April 1864. In 1827 she married William Kirkland, a professor in Hamilton College, Clinton, N. Y., removing with him to Michigan in 1839. She lived for a few years a pioneer life and her experiences furnished the basis of her earlier books published under the pseudonym, “Mary Clavers.” These include: ‘A New Home; Who'll Follow?’ her best work (1839); ‘Forest Life’ (1844); and ‘Western Clearings’ (1846). In 1842 she made her home in New York, where she established a boarding school for girls and contributed frequently to periodicals. Among her later works are: ‘The Helping Hand’ (1853); ‘Memoirs of Washington’ (1857); ‘The Destiny of Our Country’ (1864).

Kirk'land, James Hampton, American educator: b. Spartanburg, S. C., 9 Sept. 1859. He was graduated from Wofford College (Spartanburg, S. C.) in 1877, was assistant professor of Latin and Greek there in 1881–2, and professor of Latin and German in 1882–3. After European study (1883–6), he was professor of Latin in Vanderbilt University (Nashville, Tenn.) in 1886–93, and in 1893 became chancellor and professor of Latin language and literature. He wrote several monographs, and published a ‘Study of the Anglo-Saxon Poem called by Grein “Die Höllenfahrt Christi”’ (1885), and an edition of the ‘Satires and Epistles of Horace’ (1893).

Kirkland, John Thornton, American Unitarian clergyman and college president: b. Little Falls, N. Y., 1770; d. Boston 26 April 1840. He was the son of Samuel Kirkland (q.v.), was graduated at Harvard College in 1789, and ordained pastor of the Congregational (Unitarian) Church in Summer Street, Boston, in 1794, where he remained till elected president of Harvard College in 1810. He held this office until 1828. His ‘Life of Fisher Ames’ (1809) is perhaps the most valuable of the several biographies of which he was the author, and his ‘Eulogy of General Washington’ was much admired. He exerted a very great influence during his life, by the force of his intellect and character, and during his presidency the college flourished, both in its internal condition and in its external relations.

Kirkland, Joseph, American novelist: b. Geneva, N. Y., 7 Jan. 1830; d. Chicago 1894. He was a son of Caroline Kirkland (q.v.) and made his home in Illinois after 1856. During the Civil War he served in the Federal army, attaining the rank of major, and after engaging in coal mining for a time, practised law in Chicago. He published: ‘Zury, the Meanest Man in Spring County’ (1887), a faithful story of the beginning of pioneer life in Illinois; ‘The McVeys’ (1888); ‘The Captain of Company K’ appeared in 1891; ‘The Chicago Massacre of 1812’ (1893); ‘The Story of Chicago’ (1892–4).

Kirkland, Samuel, American missionary to the Indians: b. Norwich, Conn., 1741; d. 1808. He was graduated at Princeton 1765. He had previously visited the Senecas, for the purpose of studying their language. In 1766 he was ordained, and sent by the Congregational Church to preach to the Indians. After living among the Senecas for a year and a half he went to the Oneidas, whom he considered to be the highest type of the Iroquois. During the Revolution he persuaded the Oneidas and Tuscaroras, who were bent on taking one side or other, to join the Americans, instead of the British. He saw considerable war service as military chaplain, especially with General Sullivan on the Susquehanna, in 1779. In 1793 he founded the Hamilton Oneida Academy for the education of Indian boys. This is now known as Hamilton College. In 1894 the Indians made complaints concerning his administration, and he published a vindication, which with his letters and journals, furnishes a unique picture of life among the Iroquois. Consult: Lothrop, ‘Life of Samuel Kirkland’ (1848).

Kirk'man, Marshall Monroe, American railway official: b. Illinois 10 July 1842. He entered the railway service of the Chicago & Northwestern line in 1856, held various posts in different departments, was comptroller in 1881–9, and in 1889 became second vice-president. His chief works are: ‘The Science of Railways’ (1894); ‘The Classical Portfolio of Primitive Carriers’ (1896); ‘The Air Brake’ (1901); ‘Building and Repairing Railways’ (1901); ‘The Romance of Gilbert Holmes’ (1900).

Kirkpat'rick, Sir George Airey, Canadian statesman: b. Kingston, Ontario, 13 Sept. 1841. He was graduated with honors at Trinity College, Dublin, in 1861, studied law and was called to the bar in 1865. He succeeded his father as representative of Frontenac in the Dominion Parliament and sat from 1870 to 1891, when he was made lieutenant-governor of Ontario. He retired from this office in 1897.

Kirksville, kėrks'vĭl, Mo., city and county-seat of Adair County, on the Omaha, K. C. & E., and the Wabash R.R.'s; 204 miles northwest of Saint Louis. It was first settled in 1840, and under a charter of 1893 is governed by a mayor and city council elected biennially. There is a normal school here, court-house, public library and numerous churches. It lies in the centre of an extensive agricultural district and has manufactures of iron, wagons, carriages, etc. Pop. (1890) 3,510; (1900) 5,960.

Kir'kus, William, American Episcopal clergyman: b. Yorkshire, England, 9 May 1830. After 16 years spent in the Congregational ministry in London he came to this country and entered the Episcopal ministry in 1871. He was for many years prior to 1892 rector of St. Michael and All Angels Church, Baltimore. He has published; ‘Christianity, Theoretical and Practical’ (1854); ‘Miscellaneous Essays, Critical and Theological’ (1863); ‘Orthodoxy, Scripture and Reason’. (1865); ‘Religion: a Revelation and a Rule of Life’ (1886).

Kirkwood, kėrk'wŭd, **Daniel,** American educator: b. Bladensburg, Md., 27 Sept. 1814;

d. Riverside, Cal., 11 June 1895. In 1851 he became professor of mathematics in Delaware College, of which he was president in 1854–6; and in 1856–86 was professor of mathematics in Indiana University, save for the interval 1865–7, when he was professor of mathematics and astronomy in Washington and Jefferson College. He contributed largely to scientific journals, and published the volumes: ‘Meteoric Astronomy’ (1867); ‘Comets and Meteors’ (1873); and ‘The Asteroids or Minor Planets between Mars and Jupiter’ (1887).

Kirkwood, Samuel Jordan, American statesman: b. Harford County, Md., 20 Dec. 1813; d. Iowa City, Iowa, 1 Sept. 1894. Having removed to Richland County, Ohio, in 1835, he studied law, was admitted to the bar in 1843, in 1845–9 was prosecuting attorney of the county, and in 1850–1 a member of the State Constitutional convention. In 1855 he established himself in milling and farming in Iowa, the next year was a member of the State senate, and in 1860–4 Republican governor of Iowa. During the Civil War he levied 48 regiments of volunteers and equipped them at $500,000 less than the usual cost. He was United States Senator in 1865–7 (completing the unexpired term of James Harlan, resigned), was again elected governor of Iowa in 1875, in 1877–81 was a member of the Senate, and from 5 March 1881 to 6 April 1882, when he resigned, was secretary of the interior in Garfield's cabinet. He then withdrew from political life.

Kir'mess. See Kermess.

Kirtland, kėrt'lạnd, **Jared Potter,** American physician and educator: b. Wallingford, Conn., 10 Nov. 1793; d. Cleveland, Ohio, 10 Dec. 1877. He studied in the medical department of the University of Pennsylvania and was graduated from that of Yale in 1815; practised at Wallingford (1815–18) and Durham (1818–23), Conn., from 1823 at Poland, Ohio; in 1829–32 and 1834–5 was a member of the Ohio legislature; and was professor of the theory and practice of medicine in the Ohio Medical College (Cincinnati) in 1837–42. In 1843 he assisted in founding the medical department of the Western Reserve University, where he was professor of the theory and practice of medicine in 1843–64. He assisted in founding and became president (1845) of the Cincinnati Academy of Sciences, from 1865 the Kirtland Society of Natural History.

Kiser, Samuel Ellsworth, American journalist: b. Shippensville, Pa., 2 Feb. 1862. He engaged in journalism as a reporter, in 1896 contributed special sketches to the Cleveland *Leader*, and is now (1903) on the editorial staff of the Chicago *Record-Herald*. He is the author of ‘Budd Wilkins at the Show and Other Verses’ (1898); ‘Georgie’ (1890); ‘Love Sonnets of an Office Boy’ (1902).

Kishineff, kēsh-ẹ-nĕf', Russia, the capital of the government of Bessarabia, 86 miles northwest of Odessa, on the Byk, an affluent of the Dniester. It is a bishop's see, is well laid out on a picturesque site, and among its educational institutions are a seminary for priests, two gymnasia, a public library, and botanic garden. The grapevine and tobacco are cultivated in the vicinity; it has extensive manufactures of woolens; and a considerable commerce with the East. Kishineff arose around the monastery of Kishnosaref in the 15th century. During the 18th century it was subjected to attacks from the Turks and in 1812 was annexed by Russia. It came into world-wide prominence in 1903 owing to a shocking massacre of Jews on the Russian Easter and succeeding days. Pop. (1897) 108,796, consisting of Russians, Moldavians, Jews, Bulgarians, Wallachians and Tartars.

Kishon, kī'shŏn, the biblical name of a river in Palestine. It is called El-Mukatta by the modern Arabs. Here Elijah slaughtered the priests of Baal, and Deborah and Barak defeated Sisera. The French and Turks fought a battle on its banks in 1799.

Kiss, an affectionate salute by contact of the lips. This is one of the most natural expressions of human affection, although often objected to now on sanitary grounds. The child expresses its love by a kiss, and men in all stages of refinement do the same. The word in Hebrew for ‘kissing’ is the usual expression to signify adoration; and the Latin *adoratio* literally means touching with the mouth. With some nations, as the Germans and French, it is customary for men to kiss each other after a long absence, etc. Kissing the hand of the sovereign forms part of the ceremonial of some European courts. Kissing the foot is a common oriental sign of respect. The later Roman emperors, whose court ceremonial was mixed with so many servile customs, first introduced this practice into the West. The popes of the Roman Catholic Church have required it as a sign of respect from the secular power since the 8th century. Pope Constantine I. first had his foot kissed by the Emperor Justinian II. on his entry into Constantinople in 710. Valentine I., about 827, required every one to kiss his foot; and from that time this mark of reverence appears to have been expected by all popes. When this ceremony takes place the pope wears a slipper with a cross, which is kissed. In recent times non-Catholics have not been obliged to kiss the pope's foot, but merely to bend the knee slightly. Even Roman Catholic princes sometimes perform only the genuflexion. When the pope is elected he is placed on the altar, and the cardinals, first of all, perform the adoration. Each approaches the newly-elected pope and kisses his foot, then his knee, and is then embraced by the pope, and saluted on the cheek.

Kissimmee', Fla., city and county-seat of Osceola County, on Tohopekaliga Lake; on the Florida Midland and the Plant system, 18 miles south of Orlando. It has extensive fruit and vegetable interests and is well known as a hunting and fishing resort. The headquarters of the cattle raising industry of the State are here. Pop. (1890) 1,080; (1900) 1,132.

Kissing-bug. See Cone-nose.

Kis'singen, a celebrated watering-place in Bavaria, on the Saale, 30 miles north of Würzburg. It is surrounded by walls flanked with towers, and has a magnificent bathing establishment. The springs, five in number, and all saline, contain a large quantity of carbonic acid gas, are used both internally and as baths, and are considered efficacious in gout and affections of the stomach and chest. Besides 10,000 visitors annually attracted by the baths, about 500,000 bottles of water are annually exported. Pop. (1895), 4,306; (1900), 4,757.

Kist'na, a river of India, which separates the Deccan from southern India. It rises among the Western Ghâts, in the province of Bijapur, 42 miles from the Malabar coast, passes through Haidarabad, where it receives the Bhema on its left, and the Tungabudra on its right bank, both flowing, like it, from the Western Ghâts. Previous to the junction it is commonly called the Krishna, a name which is frequently given to the whole river. The united river falls into the Bay of Bengal. Its course is estimated at 700 miles. The Kistna is, perhaps, richer in gems than any other river of India. In the dry season diamonds, cat's-eyes, onyxes, and chalcedonies are said to be found, as well as a minute portion of gold.

Kit-Cat Club, a club formed in London about 1688, originally for convivial purposes, but which soon assumed a political character, having in the reign of Queen Anne become the resort of Marlborough, Walpole, Addison, Steele, and other leading Whigs. Its name was derived from that of Christopher Cat, who supplied the club with mutton-pies. The portraits (about three-quarters length) of the members were painted by Sir Godfrey Kneller, and hence a portrait of this length is called a «kit-cat.» The club was dissolved about 1720.

Kit-fox, or **Swift-fox,** a small fox (*Vulpes velox*) found in the central and northwestern parts of the United States, and especially common in the upper Columbia River region. It is about 20 inches long, with a broad, short face, and has the soles of the feet densely hairy. In summer its fur is of a brownish gray color, tinged with orange on the flanks and white below; in winter it becomes much paler. It is especially noted for its activity, and for the deep burrows which it digs, and in which its young are born and nurtured. It feeds mainly on ground squirrels and small birds.

Kitchen Cabinet, a popular name applied to certain intimate political friends of President Andrew Jackson, who were supposed to have more influence over his actions than his official advisers. They were: General Duff Green, editor of the *United States Telegraph* at Washington, the confidential organ of the administration; Major William B. Lewis, of Nashville, Tenn., second auditor of the treasury; Isaac Hill, editor of the *New Hampshire Patriot,* and Amos Kendall (q.v.) of Kentucky. He was leader of the kitchen cabinet; worked for the Jackson «second choice» movement in Kentucky; and received the office of fourth auditor of the treasury. He was a man of exceeding ability, but of low moral perceptions, and, as a politician, was the incarnation of the worst evils of the American system. Harriet Martineau wrote of him, «I was fortunate enough once to catch a glimpse of the invisible Amos Kendall, one of the most remarkable men in America. He is supposed to be the moving spring of the whole administration.»

Kitchen-middens, or **Kjökkenmöddings,** mounds of shells, bones, charcoal, and refuse, remaining upon the site of prehistoric settlements along the coasts of seas, lakes, and rivers in many parts of the world. The exploration of them has brought to light many relics of the Palæolithic and Neolithic men who formed them, and contributed greatly to the knowledge of prehistoric archæology. Extensive deposits of this kind occur in various parts of the United States, where they are known as shell-heaps (q.v.); and their formation is going on wherever savage conditions still exist.

Kitchener, kĭch'ĕ-nėr, **Horatio Herbert,** 1st Viscount Kitchener of Khartum, English general: b. near Ballylongford, County Kerry, Ireland, 22 Sept. 1850. He was educated at the Royal Military Academy, Woolwich, and entered the Royal Engineers as a lieutenant in 1871, having already seen some active service on the French side in the Franco-Prussian war. In 1874–8 he was engaged on the survey of Palestine under the auspices of the Palestine Exploration Fund Committee, and in 1878–82, except for a short period as vice-consul in Anatolia, carried out a survey of Cyprus. In 1882 he was appointed to a cavalry command in Egypt, served in the Nile expedition of 1884–5, and for his services was made a brevet lieutenant-colonel and received the Khedive's star and the second class Medjidie. He was governor of Suakin 1886–8, and distinguished himself in the latter year by the bravery and skill with which he led the Egyptian troops against Osman Digna at Handoub. In 1889 he was in command of mounted troops on the Sudan frontier, and for his bravery, was created a Companion of the Bath. From 1888 till 1892 he was adjutant-general and second in command of the Egyptian army, and in 1892 became Sirdar. He commanded the Anglo-Egyptian force which recovered Dongola for Egypt in 1896, and his services were rewarded by promotion to the rank of major-general. He was also made K.C.B. and awarded the first-class Osmanieh order. He utterly destroyed the power of the Khalifa by the battle of Omdurman on 2 Sept. 1898, and for this crowning triumph was raised to the peerage (1898) as Baron Kitchener of Khartum and of Aspall, in the county of Suffolk, receiving also the formal thanks of Parliament and a grant of £30,000. He was appointed governor-general and commander-in-chief of the Egyptian Sudan in 1899, but resigned this post and that of Sirdar of the Egyptian army in the latter part of the same year, in order to accompany Lord Roberts to South Africa as chief of his staff in the war with the Boers. When Lord Roberts left South Africa to become commander-in-chief at home, Kitchener succeeded him as commander-in-chief of the forces in South Africa, and carried on the war to its successful conclusion with the acceptance of peace conditions by the Boers on 31 May 1902. He was now created viscount and appointed commander-in-chief in India in the same year. Consult: Steevens, 'With Kitchener to Khartum' (1898).

Kitch'in, George William, English historian and clergyman: b. Hadleigh, Suffolk, 7 Dec. 1827. He was educated at Oxford, took orders in the English Church, and was prominent as tutor and lecturer at the university for many years. He became dean of Winchester in 1883 and in 1894 was translated to the deanery of Durham. He is widely known by his 'History of France,' a standard work (1873–7); but has also published 'Winchester' in the 'Historic Towns' series (1890); 'Life of Harold

Browne, Bishop of Winchester' (1895); 'Life of Pope Pius II.' (1881); etc.

Kitch'iner, William, English physician and author: b. London 1775; d. there 1827. He inherited a handsome fortune, was educated at Eton, obtained the degree of M.D. from Glasgow, and settled in London. He treated eating and drinking as the only serious business of life; and having caught the attention of the public by singularity of conduct, proceeded to promulgate, under the title of 'The Cook's Oracle,' the laws of the culinary art, professedly founded on his own practice. Besides his 'Cook's Oracle' (or 'Apicius Redivivus'), Kitchener wrote 'Practical Observations on Telescopes,' etc. (1815); 'Peptic Precepts' (1821); 'Art of Invigorating and Prolonging Life' (1822); 'Brief Memoir of Charles Dibdin' (1823); 'The Economy of the Eyes' (on spectacles, telescopes, etc., 1824-5); 'Traveler's Oracle' (1827); etc.

Kite, a small or medium sized bird of prey, of the falconine subfamily *Milvinæ*, distinguished from the other hawks by the more or less forked tail, long, pointed wings, absence of facial ruff, generally weak build and certain skeletal peculiarities. Four species occur in the United States, their proper homes being southward and in the interior; but owing to their great powers of flight they occasionally stray to other parts or rarely cross the ocean to Europe. The swallow-tailed kite (*Elanoides forficatus*) is a beautiful bird, with all the grace, figure, and capacity for flight of a gigantic swallow, and is especially prone to wander widely from its home in the lower Mississippi Valley. The remaining three are the white-tailed kite (*Elanus leucurus*), the Mississippi kite (*Ictinia mississippiensis*), and the everglade kite (*Rostrhamus sociabilis*). The last is common in Florida and southward, and has the habits of a marsh-hawk. All of the kites feed largely upon insects and small reptiles, but capture weak birds and mammals also. They nest in trees and bushes. In common with other small hawks the kites have the habit of pausing during flight suspended in mid air, in imitation of which the common paper toy is said to have been constructed and named. When falconry was in vogue in Europe the native species of kite served as the quarry in the most highly developed branch of that sport. The group is more familiar in the warm parts of the Old World than in America.

Kite, a common aerial toy in the form of two crossed sticks covered with paper, and balanced with a tail of string, on which are tied bits of cloth or paper. Kites were first employed in aid of science in 1749, by Dr. Alexander Wilson and Thomas Mellville, of Scotland, who by means of a thermometer attached to a kite were able to take temperatures above the earth's surface. Franklin's experiments with electricity by means of a kite and key are familiar to everyone. Among the men who have given much thought and labor to improve kite making are W. A. Eddy, S. P. Langley, Octave Chanute, Lawrence Hargrave, J. B. Millet, J. W. Davis, C. F. Lamson, H. D. Wise, Captain Baden-Powell, and others The first improvement was to make a tailless kite, and this was perfected by Mr. Eddy. (See AERODROME; FLYING MACHINE.)

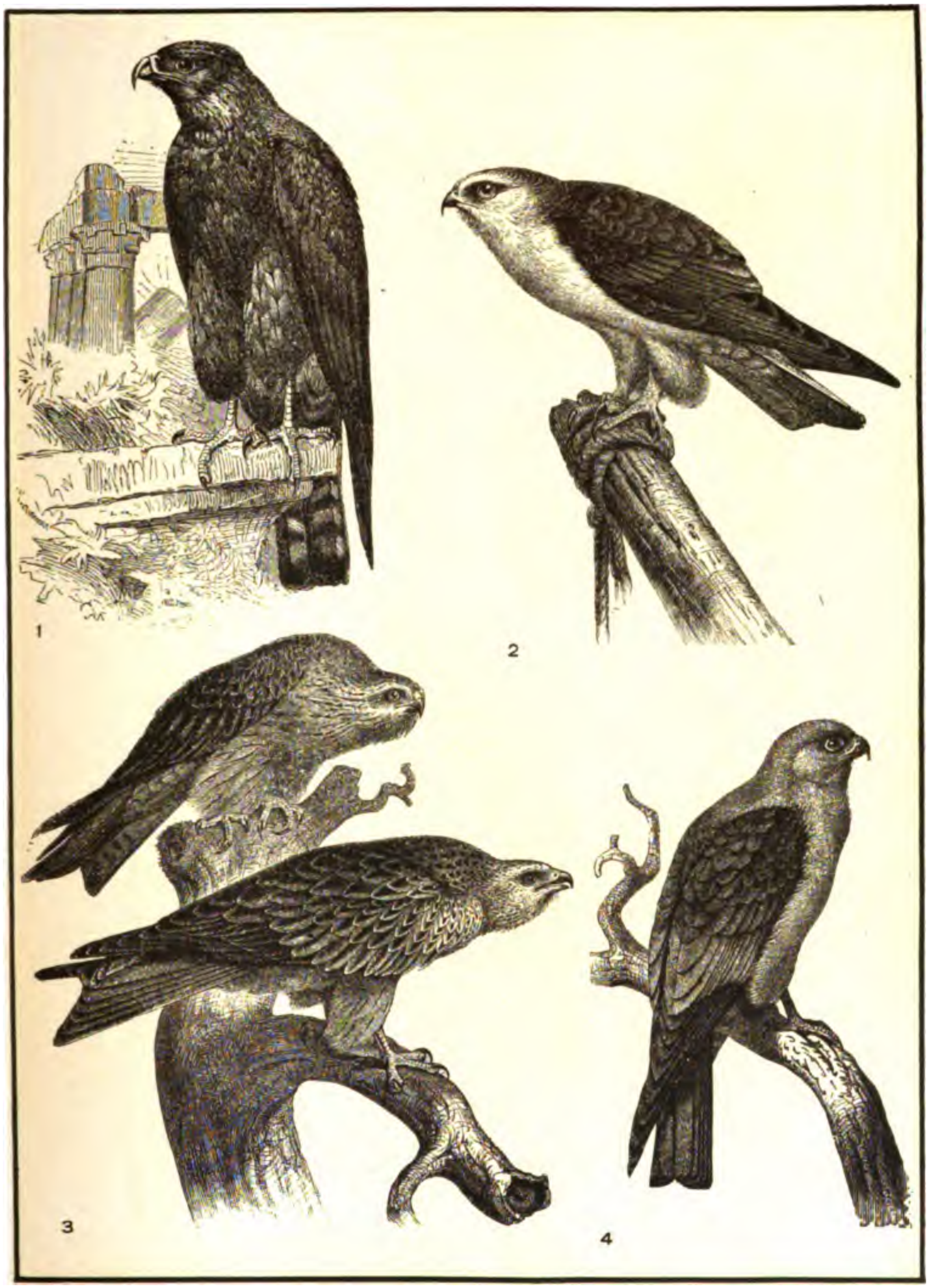
In 1895 Captain Baden-Powell, of England, weighing 150 pounds, was enabled to hoist himself 100 feet in the air by a tandem of five kites. Mr. Hargrave, with three kites, raised a total weight of 208 pounds to the height of 16 feet, as far as he cared to go. Lieutenant Wise, in 1897, with four kites, rose to 42 feet, the entire weight raised being 229 pounds. Mr. Eddy has done much to develop tandem kite flying. In 1897 he made a tandem of nine Eddy-Malay kites on a cord two miles long, with an elevation of 5,595 feet, the same being kept up for 15 hours. At Blue Hill Observatory, near Boston, this height was exceeded, the tandem of seven Malay and two Hargrave kites, with an area of 170 feet, rising 8,740 feet above Blue Hill, or 9,375 feet above sea-level. It took three miles of piano-wire and the work of three men for 12 hours to accomplish this feat. Piano wire has been found preferable to cord, having greater tensile strength and presenting less surface to the wind.

In the United States weather bureau para-kites are used for the purpose of recording the velocity of the wind, and the humidity and temperature at high altitudes, by the meteorograph. These can be obtained at a single observation and several hours before the effects are known in the lower atmosphere. Photographs have been taken by means of a camera fastened on the frame of a kite and operated by a cord, and Mr. Eddy has an arrangement of eight cameras strapped together in which all the shutters can be opened at once, and by this means a complete view of the horizon can be taken. Inventors of flying and soaring machines have made extensive use of kites in planning the construction of their various contrivances.

The first permanent station for kite flying in Europe, and the first in the world established under governmental auspices, is that at Viborg, in the extreme northern part of Denmark, the governments of Denmark, Sweden and France co-operating in the scheme. The most important building at the station is a tower 33 feet high, mounted on circular rails, so that it can be rotated easily, and left open on one side. No matter from which direction the wind blows, the tower is turned with this gap to leeward. Thus the operator can sit within, where the windlasses are, and watch his kites. The latter, of course, naturally take their lines down the wind. There are two windlasses, controlled by electric motors, one being held in reserve for immediate use in case the wire on the other breaks while in service.

Kites in War. Scientific kite flying has become a part of military tactics among European nations. Since kites have been modified and improved, their use has been continually extended, until now they are employed for quite a number of purposes, such as for signaling to a long distance or for locating the position of a camp; for obtaining a photograph of hostile country or of an enemy's fort by suspending a camera from the kite line and operating it by electric wire or clockwork; for making meteorological observations with self-recording instruments, and for lifting men for making reconnoissances. Kites offer great advantages over captive balloons in that they are more easily transported, are less expensive, and can be used in a strong wind.

KITES.



1. Black-winged Kite.
2. Egyptian Kite.
3. Black Kite and Common Kite.
4 Mississippi Kite.

Kit'son, Henry Hudson, American sculptor: b. Huddersfield, England, 1865. At Paris, he studied at the Ecole des Beaux Arts, under Bounaissieux. He was awarded three gold medals, by the Massachusetts Charitable Mechanics' Association; a gold medal of honor by the American Art Association of New York. He received a medal at the Universal Exposition, Paris, 1889, as well as that in 1900.

Kittan'ning, Pa., borough and county-seat of Armstrong County, on the Allegheny River and the Allegheny Valley railroad, 43 miles north of Pittsburg. There is natural gas here and coal and iron ore are found in large quantities in the neighborhood. It has extensive iron and steel mills, foundries, lumber and flour-mills, potteries, brick and clay works, and other industries. Pop. (1890) 3,090; (1900) 4,000.

Kittatinny (kit'ạ-tĭn-ĭ) **Mountains,** a range which extends from Ulster County south and southwest, through the northwestern part of New Jersey and into Pennsylvania. The names by which the range is generally known are in New York, the Shawangunk, in New Jersey, the Kittatinny, and in Pennsylvania the Blue Mountains. The range varies in height from 500 to 1,800 feet. The mountains belong to the Appalachians, and form the eastern ridge of the main part of the system.

Kittery, kĭt'ē-rĭ, Maine, town in York County, on the Piscataqua River and the Boston & Maine railroad; 4 miles from the Atlantic Ocean, opposite Portsmouth, N. H. The United States Naval Station and Ship-building Yards are located here on Corifincutal Island, but are known as the Portsmouth Navy Yard. The town is one of the oldest in New England. It was settled in 1624 and incorporated in 1647. It was the birthplace and former home of Sir William Pepperell. There are numerous hotels and churches here, public schools and the Rice Public Library containing 5,000 volumes. Pop. (1890) 2,864; (1900) 2,872.

Kittim, or **Chittim,** a term of Biblical origin for the inhabitants of the island of Cyprus, derived from the important town of Kition or Cition, the modern Lanarca. The «isles of Kittim» are mentioned in Jeremiah ii. 10, and Ezekiel xxvii. 6.

Kit'tiwake. See Gulls.

Kit'to, John, English Bible student: b. Plymouth, England, 4 Dec. 1804; d. Cannstadt, near Stuttgart, Germany, 25 November 1854. He was the son of a mason at Plymouth, and after obtaining a very scanty education began to assist his father, but met with a fall which deprived him of the sense of hearing. Sent to the workhouse he was presently apprenticed to a shoemaker, who used him so cruelly that the magistrates canceled his indentures. He therefore returned to the workhouse, and there, notwithstanding his physical defect, turned his talents to such account that in 1825 he published 'Essays and Letters,' which attracted no little attention. Shortly afterward he went abroad in the suite of the British envoy at the Persian court, and from 1829–33 acquired that familiar acquaintance with the East which he afterward employed in his writing. He founded and edited the 'Journal of Sacred Literature' (1848–53), and although a layman of the English Church received in 1844 the degree of D.D. from Giessen. He published 'The Pictorial Bible' (1835–8); 'Pictorial History of Palestine' (1841); 'Gallery of Scripture Engravings' (1841–3); 'Cyclopædia of Biblical Literature' (edited 1843–5); 'The Lost Senses: Deafness and Blindness' (1845); 'Physical Geography of the Holy Land' (1848); 'Daily Bible Illustrations: Morning Readings' (1849–51); 'Evening Readings'; etc. In his latter years he enjoyed a pension of £100 a year from the crown.

Kit'ton, Frederic George, English author and artist. After receiving his education at a private school in Norwich, he was put under the training of W. L. Thomas, managing director of the 'Graphic,' and became an expert draftsman and wood engraver. In 1882 he added literature to his profession of book illustration. Among his delightful appreciations of artists, illustrators and authors of his time may be mentioned 'Phiz (Hablot Knight Browne)' a memoir (1882); 'John Leech, Artist and Humorist' (1883); 'Charles Dickens by Pen and Pencil' (1890); 'Dickens and his Illustrators' (1898).

Kitt's, Saint. See Christopher, Saint.

Kittul, kĭ-tool, or **Kittool.** See Fibre.

Kiushiu, kyoo'syoo', or **Kyushu,** Japan, one of five large islands of the empire; area 13,788 square miles. It contains nine provinces but for administrative purposes is divided into seven *Ken* or prefectures. The island is mountainous and volcanic. The principal harbor is the treaty port, Nagasaki, but in 1889 five special ports of export were opened. Pop. 6,637,551.

Kiwi-kiwi, kē'wĭ-kē'wĭ. See Apteryx.

Kizil-Irmak, kiz'ĭl-ĭr-mäk' (the Turkish for Red River) a river known to the ancients as the Halys, the principal river of Asia Minor. Rising in the east of the peninsula, it flows in a circuitous route for over 500 miles, and enters the Black Sea near Sinope.

Klamath, klä-măt, a name applied to several tribes of American Indians formerly living along the Klamath River in Oregon and California, but now settled on a reservation at Klamath Lake. Their present lands were given them by treaty in 1864, the reservation containing 1,360 square miles. The Klamaths who now number about 800 are fairly civilized and are expert stock-raisers.

Klamath Lake, a small lake in Klamath County, Oregon, at the base of the Cascade Range. It is 44 miles long by 6 to 14 miles wide. It consists of two considerable bodies of water, connected by a narrow strait less than two miles wide. Klamath River is the outlet, and issues from the south end, or Lower Klamath Lake, and flows thence into California.

Klapka, klŏp'kŏ, **Gyorgy** (George), Hungarian general: b. Temesvar 7 April 1820; d. Budapest 17 May 1892. He entered the Austrian army in 1838 and rose to high rank, but in 1848, at the beginning of the revolution, joined the Hungarians and distinguished himself in nearly all the battles with the Austrians; in more than one the misfortune of the day was decided by the troops under his command. His most noted exploit was his defense of Komorn, which he continued to hold for some weeks after all the rest of Hungary had submitted.

He lived in exile till the amnesty of 1867 permitted him to return home, and then became a member of the Hungarian Diet. He published ‘The National War in Hungary and Transylvania’ (1851), one of the best works on the subject; ‘The War in the East’ (1855); ‘Memoirs’ (1869); ‘Recollections’ (1887).

Kléber, Jean Baptiste, zhŏṅ bäp-tēst klā-bār, French general: b. Strasburg 9 March 1753; d. Cairo, Egypt, 14 June 1800. He first studied architecture in Paris, then entered the military school at Munich; and having joined the Revolutionary army was appointed brigadier-general and sent to La Vendée. He afterward commanded the left wing of the army of Jourdan, directed both the passage of the Rhine at Düsseldorf and the subsequent retreat; defeated the Prince of Würtemberg, and subsequently Prince Charles. Bonaparte entrusted the command of the army in Egypt to Kléber, who, deeming resistance useless, concluded the convention of El Arish with the British, by which the French were to be conveyed home with arms and baggage. This being disowned by the English government, Kléber determined upon the resubjugation of the country, in which he was successfully engaged when he was assassinated.

Klein, klīn, **Bruno Oscar,** American composer and pianist: b. Osnabrück, Germany, 6 June 1858. He was graduated from the Gymnasium Carolinium in his native town and studied music at the Royal Music School at Munich. He came to the United States in 1878 and has since made his home in New York, where he is professor of music at the Convent of the Sacred Heart. He has published many songs and motets, a large number of compositions for the piano, and various other works. In 1895 his grand opera, ‘Kenilworth,’ was produced at Hamburg.

Klein, Felix, German mathematician: b. Düsseldorf 25 April 1849. He was educated at Bonn, became Plücker's assistant in the physical institute in 1866, was appointed lecturer at Göttingen in 1871, professor at Erlangen in 1872, and held chairs from 1875 in the Technical High-school of Munich, from 1880 at Leipsic, and from 1886 at Göttingen. In 1893 he represented Göttingen at the World's Columbian Exposition at Chicago. He exercised large influence on American mathematics, having taught many instructors in institutions in this country. Among his works are ‘Ueber Riemanns Theorie der algebräischen Funktionen’ (1882); ‘Vorlesungen über das Ikosaëder und die Auflösung der Gleichungen vom fünften Grad’ (1884); ‘Einleitung in die höhere Geometrie’ (1893), and ‘Evanston Colloquium’ (1893).

Kleist, Heinrich Bernt Wilhelm von, hīn'rĭн bĕrnt vĭl'hĕlm fōn klīst, German dramatist: b. Frankfort-on-the-Oder 18 Oct. 1777; d. Wannansee, near Potsdam, 21 Nov. 1811. He entered the army in 1795, but left it in 1799 to study at Frankfort and Berlin, and later engaged in journalism in Dresden and Berlin. His first drama, ‘Die Familie Schroffenstein,’ was published in 1803, and was followed by ‘Amphitryon’ (1807); ‘Penthisilea,’ a tragedy (1808); ‘Kätchen von Heinbronn’ (1810); ‘Der zerbrochene Krug’ (The Broken Jug) (1811). A volume of ‘Tales’ appeared (1810–11); and posthumously, ‘The Battle of Hermann,’ and ‘Der Prinz Von Homburg.’ He exhibits some of the worst faults of the Romantic school, to which he belongs, but nevertheless his best plays, such as ‘The Prince of Homburg’ and ‘The Broken Pitcher’ possess sufficient vigor and fidelity to life to make them popular even at the present day. The best of his tales is ‘Michael Kohlhaas,’ a story of Brandenburg in the Middle Ages. He failed to gain recognition and shot himself, after first shooting a woman whom he loved, and who like him was weary of life. His works did not receive notice till after his death, when they were made known by Tieck.

Klephtes, klĕfts (Greek, “thieves”), Greek bandits who kept themselves free in the mountains, and carried on a perpetual war against Turkish rule, considering everything belonging to a Turk a lawful prize. During the war of independence these Klephtes furnished the Greeks with some of their best soldiers and leaders. Whole tribes, as the Suliotes and Chimariots in Epirus, and the Sphakiots in Crete, are to be numbered among them.

Kleptoma'nia (from Greek *κλέπτειν*, steal, and *μανία*, madness), a mania for stealing, a propensity often regarded as being irresistible and involving a kind of moral insanity. It is frequently pleaded in law courts as an excuse for theft, although the act constitutes a legal offense. See INSANITY.

Klinger, Max, German painter, etcher and sculptor: b. Leipsic 18 Feb. 1857. He was a pupil of Gussow at Karlsruhe and later at Berlin; studied also at the Berlin Academy; was active at Rome in 1888–92; and from 1893 in Leipsic. He was at first chiefly an etcher (1879–86), perhaps the best of his work in this sort being the ‘Brahms-Phantasien’ (1894), deriving their subjects from various music of that composer. Then he directed his attention to painting in oils, and executed heroic canvases of ‘The Crucifixion’ and ‘Christ on Olympus.’ One of the best of his plastic works is his polychromatic statue of Beethoven (Leipsic Museum), in which onyx, bronze, and differently colored marbles are combined. He published ‘Malerei und Zeichnung’ (3d ed. 1899).

Klip'springer, a small, robust antelope (*Oreotragus saltator*), about equal in size to the chamois, and resembling it in habits, found in the mountainous districts of South Africa. It is yellowish-gray, and the hair is long, and makes a rough fur. The flesh of the klipspringer is particularly esteemed; the hair is also valued for stuffing saddles; and it has therefore become rare in localities where it was once common. The pinnacles and precipices in which it delights make hunting it with dogs impossible, but to get within rifle shot of it is not difficult. Many interesting habits are given by writers on South African zoology and natural history.

Kloet, a volcano on the island of Java. Although among the smaller of the numerous volcanoes there, it came prominently into notice on account of its eruption in May 1901, in connection with which, besides its destructive effects, there were peculiar atmospheric phenomena.

Klon'dike, The, a famous gold-bearing stream which enters the Yukon, the principal river of the Northwest Territory, Canada, 45 miles below the mouth of Sixty Mile Creek. In recent years the term Klondike is applied to the region surrounding the river and its tributaries, which lies between Alaska and the British possessions. As early as 1862 gold was discovered in Alaska, but no special notice was taken of it; 13 years later gold was found at the head of the Stikine River. In 1880, Juneau, a Frenchman, with a companion started out from Sitka and traveling north discovered gold in a creek which they named Gold Creek, and at the mouth of this creek founded a town first called Harrisburg and later Juneau and which soon became the centre of mining supplies and a considerable fur trade. In 1886 a rich find was reported on Stewart River, in the Yukon district, and the following year an expedition was sent out by the Canadian government, headed by George M. Dawson, which explored the Upper Yukon and reported the existence of an abundance of gold. The difficulties and hardships to be encountered in reaching the location were so great that but a few hundred miners attempted to seek their fortunes there. These, however, persevered and established Circle City on the Alaska side of the boundary and by 1892 were taking out an annual total of about $300,000.

It was not till 1897 that the wonderful riches of the Klondike region were made known through George McCormick, who went from Illinois to Alaska in 1890 and there married an Indian squaw. In 1897 he located at the mouth of the Klondike River for the purpose of salmon fishing, but this not proving profitable that season he in company with some Indians moved up the river till they came to Bonanza Creek, which they began to explore for gold. They found large quantities of paying dust and located an extensive claim. Going to the Indian village from which they came for supplies, the news of their find quickly spread, other claims were forsaken, some of the prosperous towns were deserted and miners from every direction poured into the newly found gold fields. Joseph Ladue, an old prospector and well-known miner, was one of the first to explore the country, and his statements gave an impetus to the steadilv increasing stream of gold hunters.

Clarence Berry, a miner, returned to Juneau in the fall of 1897 on his way home to San Francisco with $130,000 in dust which had been thawed and sluiced out of 30 box lengths of soil in a few weeks' time. And this is but one of many similar experiences, which aroused the wildest excitement all over the United States, with which the Californian «gold fever» of 1849 stands no comparison. All through the fall and winter of 1897 the mad rush for the Klondike region continued. The almost unknown towns of Juneau, Dyea and Skaguay sprang into sudden prominence and rapidly added to their population, while Dawson City in which the first hut was built in September 1896, six months later had 500 houses, and in 1901 had grown to a prosperous city with handsome residences, hotels, banks, schools, churches and many modern improvements.

The Klondike is not far from the arctic regions, and for seven months of the year intense cold prevails, varied by furious snow storms which begin in September and occur at intervals till May. By 20 October ice is formed over all the rivers. The ground for the better part of the year is frozen to the depth of from 3 to 10 feet, and the only way to get at the gold is to thaw the earth by building a fire and afterward break up the soil with a pick. When the warmer weather comes this is washed in running water which carries away the dirt and pebbles, leaving the gold at the bottom of the pan or sieve. Many nuggets of fine gold have been found varying in value from a few dollars up to a hundred. The amount of gold dust and nuggets taken out of the Klondike region within two months after the discovery was $5,000,000, and up to the close of 1902 the entire output was estimated at $30,000,000. See ALASKA.

Klopsch, klŏpsh, **Louis**, American journalist and philanthropist: b. Germany 26 March 1852. As proprietor of the New York 'Christian Herald' he has instituted several extensive international charities. Since 1892 he has raised through his paper and distributed for the relief of human suffering over $2,000,000. In 1892, during the Russian famine, he was received by the present Czar Nicholas II., and in 1898 President McKinley appointed him one of the commissioners to relieve the reconcentrados of Cuba. In 1900 he visited the famine fields of India; in 1901 Li Hung Chang by cable interested him in behalf of the starving people of Shensi, and in 1903 he visited the famine districts of the north of Europe, where he had audiences with the King and Queen of Sweden, Queen Alexandra of England, the Empress of Russia, and the King of Denmark. Since 1900 he is supporting and educating 5,400 famine orphans in India.

Klopstock, Friedrich Gottlieb, frēd'rĭʜ gōt'lēb klop'stok, German poet: b. Quedlinburg, Prussia, 2 July 1724; d. Hamburg 14 March 1803. He is widely famous as the author of the sacred epic, 'The Messiah,' the first three cantos of which were published in 1748. They excited general attention, and in consequence Klopstock was invited to Copenhagen by the minister Bernstorff, and offered a small pension. In 1764 he wrote his drama 'Hermanns Schlacht' (Battle of Arminius), and in 1771 left Copenhagen for Hamburg, under the character of Danish secretary of legation and counsellor of the margraviate of Baden. In Hamburg he finished his 'Messiah' (1773). He also wrote 'Die Gelehrtenrepublik' (The Scholar's Republic) (1744), his chief work in prose; 'Geistliche Lieder' (1758); 'Oden' (1771); and several dramas, in addition to the one already named. His reputation was greater in his own day than has since been the case, but he is admitted to have done great service to German literature in assisting to free it from foreign, especially French influence. Consult: Lyon, 'Ueber Klopstocks Verhältniss zu Goethe' (1879); Lappenberg, 'Briefe von und an Klopstock' (1867).

Klotz, klōts, or **Clotz, Matthias**, Tyrolese violin-maker: b. about 1640; d. about 1696. He was a pupil of Jakob Stainer at Abson near Innsbruck, there established himself, and made violins much in Stainer's manner, so that only the less metallic tone of Klotz's instruments offers a distinguishing feature. His violins range in date from 1675 to 1696.

Knapp, năp, **William Ireland**, American educator: b. New York 10 March 1835. He was graduated from Colgate University, Hamilton, N. Y., and was professor of modern languages there, 1860–5. He held similar positions at Vassar College 1865–7; Yale 1879–92; and the University of Chicago 1892–5. He has since lived in Europe and has published ‹Life of George Borrow› (1883); and several Spanish and French text-books; and has edited several Spanish authors as well as Borrow's ‹Lavengro,› and ‹Romany Rye› (1900).

Knap'sack, a bag or case of leather or strong cloth, used by soldiers, tourists, and other travelers for carrying light personal baggage. Knapsacks are made in various styles, and are usually strapped to the back.

Knap'weed. See Centaurea.

Knaus, Ludwig, lood'vĭg knows, German painter: b. Wiesbaden 5 Oct. 1829. From 1845 to 1852 he studied art at Düsseldorf under Sohn and Schadow, but soon shook himself free from their influence and started on a path of his own. He chose scenes from country life and in 1850 painted ‹The Country Dance›; ‹The Players,› now in the gallery at Düsseldorf, a replica being in the gallery of Leipsic. His early pictures in this style were received with favor, although characterized by the dark, dull coloring of the Düsseldorf school. In 1852 he went to Paris, and resided there for eight years, which were fruitful in many well-known pictures of his early style, ‹The Golden Wedding› (1858); ‹The Baptism› (1859); and ‹Starting for the Dance.› Returning to Düsseldorf in 1866, he remained there for eight years, during which period he produced the pictures on which his reputation as a genre painter is chiefly founded. Amongst these is ‹The Child's Party› (1869), in the Berlin National Gallery; ‹Funeral in a Hessian Village› (1871); ‹The Goose-Girl› (1872). These works are distinguished by naturalness and naïveté, by delicate humor, mastery of detail, lifelike coloring and vivid expression. After his appointment to the direction of a studio in the Art Academy at Berlin he reached his latest manner, which was formed largely by his study of the Dutch school, from which he acquired his final skill as a colorist. His pictures, however, no longer showed the naïveté, the directness of his earlier productions; which were replaced by thoughtfulness and a striving after the didactic or admonitory. The most remarkable paintings of this period are ‹The Holy Family› (1876); ‹Tavern Scene — Bad Ways› (1876); ‹The Refractory Model› (1877); etc. He has also painted many portraits combining the picturesqueness of genre with lifelike expression. Among his miscellaneous works are his designs in Watteau style for room decorations, his lead pencil sketches and aquarelles. Very many of his works have been reproduced by photography or engraving.

Kneeland, nē'land, **Samuel,** American naturalist: b. Boston, Mass., 1 Aug. 1821; d. Hamburg, Germany, 27 Sept. 1888. He was graduated from Harvard in 1840, practised medicine in Boston 1845–50, and was an army surgeon during the Civil War. In 1866 he became professor of zoology and physiology in the Massachusetts Institute of Technology. He was a member of numerous scientific societies, and in addition to editing ‹The Annual of Scientific Discovery› (1886–9), a translation of ‹Andry's Diseases of the Heart› (1847), and Smith's ‹History of the Human Species,› wrote ‹Science and Mechanism› (1854); ‹The Wonders of the Yosemite Valley and of California› (1871); ‹An American in Iceland› (1876).

Kneipp, knīp, **Sebastian,** German clergyman: b. Stefansried, Bavaria, 17 May 1821; d. Worishofen, Swabia, 17 June 1897. He studied theology at Dillingen and Munich, became a Roman Catholic priest in 1852, and pastor at Worishofen in 1881. He became known for the «Kneipp cure,» which he advocated for years. This method was based on water, fresh air, sunshine, and a scheme of regular activity, and included walking barefoot in dew-moistened grass and on snow. Kneipp wrote: ‹Meine Wasserkur› (1887; Eng. trans. 1891); ‹Mein Testament› (1894); ‹Vorträge in Wörishofen› (1894–8); and other works.

Kneisel, nī'zĕl or knī'zĕl, **Franz,** German-American musician: b. Rumania 1865. He was a pupil in violin-method of Grün and Hellmesberger, became concert-master of the orchestra at the Hofburg Theatre of Vienna, of Bilse's orchestra at Berlin, and later of the Boston Symphony Orchestra. He appeared prominently with the Symphony as solo violinist, and organized under his leadership the Kneisel quartette for chamber-music, in which he played the first violin part. This quartette, all of whom were also members of the Symphony, withdrew from the latter in 1903 to undertake an extensive tour.

Kneller, nĕl'ėr, Sir **Godfrey,** originally Gottfried Kniller, Anglo-German portrait painter: b. Lübeck 8 Aug. 1646; d. Twickenham, England, 19 Oct. 1723. He studied under Bol and Rembrandt at Amsterdam. He visited Italy in 1672, and painted several historical pieces and portraits both at Rome and Venice. On his return he visited England, in 1675, and was introduced to Charles II., by whom he was much patronized. He was equally favored by James II. and William III., for the latter of whom he painted the «beauties» at Hampton Court, and several of the portraits in the Gallery of Admirals. He also painted the portrait of the Czar Peter for the same sovereign, who in 1691 knighted him, and made him gentleman of the privy chamber. Queen Anne continued him in the same office, and George I., in 1715, made him a baronet. He continued to practise his art to an advanced age. He left money and instructions for a splendid monument to himself in Westminster Abbey, erected by Rysbrack in 1729, which bears an epitaph by Pope. His coloring is true and harmonious, and his drawing correct, but he displays a great want of imagination in his pictures, the attitudes, action, and drapery being insipid, unvarying, and ungraceful. Many of the portraits bearing his name were only partly painted by himself, the less important portions being done by assistants.

Kniazhnin, Jakov Borisovich, Russian littérateur and dramatic author: b. Pskov 3 Oct. 1743; d. 14 Jan. 1791. He was educated in the University of Saint Petersburg, entered the army, where however he stayed only a short time, and for a number of years was connected with the civil service. In 1783 he became a member of the Russian Academy at Saint Petersburg. Of his tragedies the majority are but imitations of French plays, containing with the exception of one or two nothing original. His comedies are replete with bright passages and full of spirit. The tragedies most worthy of mention are: ‹Didon› (1769); ‹Vladimir i Iaropolh› (1779); ‹Vladisan› (1786); ‹Roslav› (1784); ‹Vadim Novgorodskii› (1789). The two last were patriotic plays, some of the passages of the ‹Vadim› being of such a character as to alarm Catharine II. and cause its suppression, but it was published in 1793, two years after the death of the author. Of his comedies the most noteworthy are: ‹Khvastum›; ‹Chudakhi›; and the light opera ‹Neschastie ot Karety.› A complete edition of his works, in four volumes, was published in 1787, several subsequent editions being published in two volumes in 1847–8.

Knickerbocker, nĭk'ėr-bŏk-ėr, **Herman,** American lawyer and legislator: b. Albany, N. Y., 27 July 1782; d. Williamsburg, N. Y., 30 Jan. 1855. He studied law at Albany, N. Y., was admitted to the bar in 1803, and entered practice in Albany. In 1809–11 he was a Federalist representative from New York in the 11th Congress, in 1816 was elected to the New York State assembly from Rensselaer County, and for some time also held the office of county judge. He became a Democrat during Jackson's administration. Through his hospitality he was known as «Prince Knickerbocker.»

Knickerbocker's History of New York, a celebrated work written by Washington Irving (q.v.). It gives picturesque description of the early burgomasters, the patroon Killian Van Rensselaer, Stoffel Brinkerhoff, William Kieft, called «William the Testy,» Antony Van Corlear the trumpeter, Peter Stuyvesant with his silver leg, and a complement of Indians, Dutch, and Yankee settlers. «Before the appearance of my work,» says Irving, «the popular traditions of our city were unrecorded; the peculiar and racy customs and usages derived from our Dutch progenitors were unnoticed or regarded with indifference, or adverted to with a sneer.»

Knigge, Adolphus Francis Frederic Louis, Baron de, German author: b. Brendenbeck, near Hanover, 16 Oct. 1752; d. Bremen 6 May 1796. In 1769 he went to the University of Göttingen, where he studied law, later became assessor at Cassel, in 1777 was made a chamberlain at Weimar, and finally in 1791, after leading a very unsettled life, became a resident of Bremen. Here he joined the Illuminati and later became implicated in the disputes relating to that secret order. Of his writings by far the most important is his ‹Ueber den Umgang mit Menschen› (On Intercourse with Men), which contains much good advice and a collection of upright methods of living so as to get the greatest joy and happiness at the same time being useful. Of his other works those most read were: ‹Der Roman meines Lebens› (1781–7); and ‹Die Reise nach Braunschweig› (1792).

Knight, nīt, **Charles,** English editor and publisher: b. Windsor 19 March 1791; d. Addlestone 9 May 1873. He succeeded his father as a bookseller in Windsor, and for several years edited a Windsor newspaper. Having removed to London in 1823, he established ‹Knight's Quarterly Magazine,› in 1827 undertook the superintendence of the publications of the Useful Knowledge Society, for which he superintended and published the ‹Library of Entertaining Knowledge›; the ‹Penny Magazine› and the ‹Penny Cyclopædia,› afterward remodeled as the ‹English Cyclopædia›; etc. Other publications of his were the ‹Pictorial Bible,› the ‹Pictorial Prayer-book,› ‹Pictorial Shakespeare,› and many others. The Shakespeare was edited by Knight himself, and has, both for its text and notes, taken a high place among editions of the great dramatist. The most important of his own writings, the ‹Popular History of England,› appeared 1854–61. His autobiography, ‹Passages of a Working Life During Half a Century,› was issued 1863–5.

Knight, Daniel Ridgeway, American painter: b. Philadelphia, Pa., 1850. He has been a pupil of Gleyre and a student at the Ecole des Beaux Arts, at Paris (1872), and four years later was in the studio of Meissonier, from whom he learned many of the secrets of brilliant technique. He has received honors from Paris, Munich, and Antwerp for his exhibited works, and has also been awarded medals in his own country. He is a painter, rather French than American, and he has idealized the French peasantry in more than one of his refined and delicately designed pictures, among which we may mention as especially characteristic of his charming qualities ‹The Veteran› (1870); ‹The Old Beau› (1873); ‹Washerwoman› (1875); ‹Harvest Scene› (1877); and ‹Sans Dot› (1883).

Knight, Edward Frederick, English journalist and author: b. 23 April 1852. He was graduated from Cambridge and in 1891 became a member of the staff of the London *Times* as a correspondent, being with the armies in the Sudan campaign of 1896, and in Greece in 1897. He has written: ‹Albania and Montenegro›; ‹The Cruise of the Falcon›; ‹The Threatening Eye›; ‹Sailing›; ‹The Falcon on the Baltic›; ‹The Cruise of the Alerte›; ‹Save Me from My Friends›; ‹Madagascar in War Time›; ‹Rhodesia of To-day›; etc.

Knight, Edward Henry, American mechanical expert: b. London, England, 1 June 1824; d. Bellefontaine, Ohio, 22 Jan. 1883. After studying both surgery and steel engraving he came to this country in 1845 and settling in Cincinnati was a patent attorney for several years. In 1863 he entered the civil service in Washington, D. C., where he prepared the annual reports of the Patent Office and established the ‹Official Gazette of the United States Patent Office› in 1871. He served on the international juries of world's fairs at Philadelphia (1876), Paris (1878), Atlanta (1881), and was made a chevalier of the Legion of Honor in 1878. He published ‹The American Mechanical Dictionary› (1872–6); ‹The New Mechanical Dictionary› (1876–80).

Knight, Richard Payne, English numismatist and archæologist: b. Wormsley Grange, near Ludlow, Herefordshire, 1750; d. London 24 April 1824. Having been bequeathed a fortune, he traveled extensively, wherever he went, and especially in Italy, where he went in 1767, 1777, and 1785, making a specialty of collecting ancient coins, bronzes, gems, drawings, and other antiques. From 1780 to 1806 he was a member of Parliament, and for 10 years, 1814–24, served as one of the trustees of the British Museum, to which, upon his death, he left his magnificent archæological collection. His works, which were numerous, included: 'An Account of the Remains of the Worship of Priapus lately existing at Isernia in the Kingdom of Naples' (1786); 'Analytical Essay on the Greek Alphabet' (1791); 'An Inquiry into the Symbolic Language of Ancient Art and Mythology'; 'Principles of Taste' (1805); etc. He also published several volumes of poems and an edition of Homer (1816).

Knight, Sarah Kemble, American author: b. Boston 19 April 1666; d. near Norwalk, Conn., 25 Dec. 1727. In 1706–13 she conducted at Boston a school in which Samuel Mather and Benjamin Franklin were at one time pupils. By New England custom she was styled «Madam» Knight as a token of respect. Her 'Journal Kept on a Journey from Boston to New York in the Year 1704' (1825) is a diary record evidently compiled from daily notes made on the way. It is valuable for its account of customs and manners and its descriptions of the settlements, being at the same time interesting for its original orthography and interspersed rhymes.

Knight, Thomas Andrew, English horticulturist: b. Wormsley Grange, near London, Herefordshire, 10 Oct. 1758; d. London 11 May 1838. After graduating from Baliol College, Oxford, he took up the study of horticulture. He first brought himself before the public in 1795 by the publication of the results of his researches into the propagation of fruit-trees and the diseases prevalent among them. Beside the papers, 46 in number, which he contributed to the 'Transactions' of the Royal Society, he wrote: 'A Treatise on the Culture of the Apple and the Pear' (1797); 'Pomona Herefordiensis, or Natural History of the Old Cider and Perry Fruits of the County of Hereford' (1809). His 'Physiological and Horticultural Papers' were published in 1841 together with a biographical sketch of his life.

Knight, William Angus, Scottish philosopher and author: b. Mordington, Scotland, 22 Feb. 1836. He was educated at the University of Edinburgh and since 1876 has been professor of moral philosophy at the University of St. Andrews. He is widely known as a student of Wordsworth, whose works he has edited in 12 volumes (1896–7). Among his own writings may be cited 'Studies in Philosophy and Literature' (1879); 'Essays in Philosophy, Old and New' (1890); 'The English Lake District as Interpreted in the Poems of Wordsworth' (1878–91); 'Through the Wordsworth Country' (1892); 'Varia' (1901); 'Some 19th Century Scotsmen' (1902).

Knights of Columbus. The Knights of Columbus is a fraternal and beneficial order exclusively for Catholics, instituted in New Haven, Conn., 2 Feb. 1882, and incorporated under the laws of the State of Connecticut 29 March 1882. While the primary object of the founders was to provide insurance for its members at nominal rates, the scope of the order expanded with its growth, and the social strength of the order is now as pronounced as was its object of insurance during the first 10 years of its existence.

Rev. M. J. McGivney, then curate of Saint Mary's Church, New Haven, was the moving spirit in bringing the order into existence, and in his efforts he was assisted by the following, named as incorporators in the charter granted by the State of Connecticut: M. C. O'Connor, M.D., James T. Mullen, John T. Kerrigan, William M. Geary, C. T. Driscoll.

From Connecticut the order spread into Rhode Island, Massachusetts, New York, and New Hampshire. After its introduction into Massachusetts its growth became phenomenal, and each succeeding year since 1892 has witnessed marked accretions to its membership and to its financial strength.

The Knights of Columbus issue insurance policies for $1,000, $2,000, and $3,000 to desirable risks between the ages of 18 and 60. The rate of each member increases once in five years, until the age of 60 is reached, when the member pays a level rate for the rest of his life, this level premium being based upon his age at initiation.

The Knights of Columbus operate in every State and Territory of the United States, and also in the provinces of Quebec, Ontario, Prince Edward Island, and New Brunswick. On 9 Jan. 1904 a charter was granted for an associate council in Manila, P. I. The total membership on 1 Jan. 1905 was 127,206, comprising 43,537 insured and 83,669 associate members. There are 33 State councils and 940 subordinate councils.

The total net assets of the society on 1 Jan. 1905 were $1,290,196.31, and of this amount $1,239,137.89 are deposited in the mortuary reserve fund, for the protection of outstanding insurance contracts. The per capita surplus is $28.56.

The order aims to develop a practical Catholicity among its members, and its four degrees serve to impress upon candidates the nature and sacredness of their obligations to Church and state. In 1904 the Knights of Columbus presented $50,000 to the Catholic University in Washington for a chair of American history.

Rev. M. J. McGivney,
Middletown, Conn.

Knights and Ladies of Honor, a fraternal beneficiary society founded in the United States in 1877. In 1902 it reported a membership of 63,000; benefits disbursed since organization, $19,000,000. The benefits disbursed in 1902 amounted to $1,173,000. The society has a Supreme Protector, 16 grand lodges, and 1,160 sub-lodges.

Knights of the Golden Circle, a secret organization in the United States, established a few years before the Civil War, and formed with the object of destroying the Republic and setting up a great Southern empire with negro slavery as its cornerstone, and also with the purpose of controlling the great commercial interests of cotton, sugar, and tobacco. With its centre at Havana, Cuba, the «Golden Circle» intended to embrace in the territory of the new government a radius of 1,200 miles, and to include parts of Central America. The organization was never fully consummated, although thousands of persons joined in the movement and many lodges or councils were instituted.

Knights of the Golden Eagle, a secret society founded in the United States in 1873. It had in 1903, 15 grand castles, 800 sub-castles, and 75,597 members. The benefits disbursed during 1902 amounted to $231,794.

Knights of Honor, a fraternal benevolent society founded in the United States in 1873. Its membership in 1902 was reported at 62,173; benefits disbursed since organization, $71,231,447, and during 1902 the amount was $3,074,649. It has a supreme dictator, 36 grand lodges, and 1,918 subordinate lodges.

Knights Hospitallers. See HOSPITALLERS.

Knights of Labor, an American labor organization which originated among the garment-cutters of Philadelphia in 1869. It was founded by 10 members of the trade under the leadership of Uriah Stevens (q.v.), as a secret society, with a rather elaborate ritual. It grew slowly at first; though workingmen of all trades were admitted, it was not until 1872 that the second local assembly was formed, but in that year 27 locals were organized, all in Philadelphia; the first local organized outside that city was that of the gold-beaters of New York. In its first organization politicians, physicians, lawyers, and liquor-dealers were excluded from membership; the two latter classes are still excluded. The first general assembly was held at Reading, Pa., in 1878, where seven States were represented. At this meeting a declaration of principles was adopted which remains substantially the same: the purpose was declared to be the «organizing, educating, and directing of the power of the industrial masses,» in order to «make industrial and moral worth, and not wealth, the true standard of national and individual greatness,» and to «secure to the workers the full enjoyment of the wealth they create.» To secure these aims, the organization demanded certain legislative remedies, including the referendum, the establishment of a bureau of labor statistics, abrogation of class laws, prohibition of the employment of children under the age of 15, abolition of the contract system on public works, and of the convict-labor system, and reforms in the financial and land laws; and in the industrial field it proposed to «establish co-operative institutions which will tend to supersede the wage-system,» to secure both sexes equal rights, and gradually to reduce the hours of labor to 8 per day. In 1881 all secrecy was abolished, and in 1882 a revised constitution adopted, in accordance with which the organization consists of local assemblies, of not less than 10 members, of whom three fourths must be wage-earners or farmers; district assemblies, formed by not less than five locals, and the general assembly, which meets annually for the election of officers and the transaction of business. The executive officers are a general master workman, general worthy foreman, general secretary-treasurer, and general executive board. The constitution provides also for the support of strikes approved by the executive board after all attempts at conciliation have failed. The organization grew rapidly after this time, till in 1886 delegates at the general assembly represented over 300,000; at that time, however, dissensions began which resulted in a split and the formation of the American Federation of Labor (q.v.). Though the organization remained powerful for several years, its numbers began to decrease, and in 1903 it reported only 40,000, and its influence gradually declined. In 1890 ‘The Journal of United Labor’ was established; later the name was changed to ‘Journal of the Knights of Labor,’ and it is the official journal of the organization.

The Knights differ radically from the trades unions in the basis of their organization; their ideal is to organize labor without distinction of trade, and to harmonize individual and trade interests with the interest of the whole; though locals may be organized on trade lines, no autonomy of trades is allowed. This and the fact that the general executive board tried to exercise a too centralized authority were among the chief causes of dissatisfaction. Strikes were at one time condemned by the general assembly (1880), but later the organization took part in a number of strikes and also made use of the boycott; violence has been at all times condemned. Consult: Mac Neill, ‘The Labor Movement; the Problem of To-day’; Powderly, ‘Thirty Years of Labor’; Wright, ‘Historical Sketch of the Knights of Labor’ (in ‘Quarterly Journal of Economics,’ Vol. I., p. 137).

Knights of the Maccabees of the World, a fraternal beneficiary association having its general offices at Port Huron, Mich. An association bearing this name was first organized in the city of London, Canada, in the year 1878, by W. D. McLaughlan and several other gentlemen of that city. The Association grew rapidly, and its tents, as its local lodges were called, sprung up all over the Canadian provinces and in many of the States of the American Union.

The Association takes its name from the Maccabees, a chivalrous and religious people whose history is given in the apochryphal writings of the Old Testament. The leading character in this history was Judas Maccabeus, a valiant soldier and one of the foremost generals of the period in which he lived. During the wars in which the Maccabees were engaged and in which he was their leader he required that a portion of the fruits of all their victories should be set aside for the benefit of the widows and orphans of those who had fallen in battle.

It was this particular practice and characteristic that probably suggested to Mr. McLaughlan and his co-laborers the name for their new society, because the purpose of this society, as set forth in their laws, was to unite fraternally all white male persons of sound bodily health and good moral character, between the ages of 18 and 70 years of age, and to provide for such members benefits in case of disability, and to the beneficiaries of such members benefits in case of their death.

The main purpose of this Association is to provide social and fraternal intercourse for its members, and benefits in the way of insurance to the families of deceased members. It does not now provide for the payment of other than temporary disability benefits in case of sickness or accident, and death benefits as above stated.

It has distributed about twenty-three millions of dollars among its disabled members and the beneficiaries of its deceased members. Its rates of contribution are based upon the Fraternal Congress Mortality Table and 4 per cent.

Its death benefits are provided under two plans, one, the «whole life» plan, in which its rates of contribution are uniform throughout the continuance of membership; the other, the «term» plan, under which the rate of contribution continues until the member reaches the age of 65, when it changes and becomes uniform for the balance of life at $3 per month per $1,000. Careful medical examination is required of all benefit members. Its accumulated funds 1 May 1905 amount to about $4,250,000. Its work is conducted on the lodge system under ritualistic ceremony. Its form of government is thoroughly representative, every member having a voice in the conduct of its affairs, making of its laws, the election of its officers, and the fixing of their compensation.

In 1904, the name of the Association was changed to «The Knights of the Maccabees of the World.» The general meeting of the law-making body (the Supreme Tent) is held once in three years, at which the members are represented through delegates chosen from subordinate tents, conventions, and great camps. In the interim between the meetings of its governing body its affairs are administered by a board of seven trustees, consisting of the supreme commander and six others elected by the Supreme Tent. The board of trustees has the general custody and management of the funds of the Association; under its direction all investments are made, the laws of the Association requiring that all investments shall be made in government, State, and municipal bonds.

Knights of the Modern Maccabees, a fraternal beneficiary society. The order derives its name from the ancient Maccabees, a chivalrous and religious race, whose history is portrayed in the first and second books of the «Maccabees,» apocryphal writings of the Old Testament, dating back to 175 B.C. The exact meaning of the name «Maccabees» is veiled in obscurity, but by some is held to be derived from a Hebrew term signifying «a hammer.» The ancient Maccabees were in the habit of putting aside a goodly portion of the «spoils» of victory for the benefit of the widows and orphans of those soldiers who had fallen in battle. Hence the conception of the «Modern Maccabees» as outlined in the objects of the order: «To unite fraternally all white male persons of sound bodily health and good moral character, who are socially acceptable, between the ages of 18 and 70 years of age, and to provide for life and disability benefits to those between the ages of 18 and 51 years,» The name «Maccabees» was first applied in modern times to a society organized in London, Ontario, in 1878, which in 1881 became defunct. The plans of the organization proved to be crude and unbusiness-like, as the rate of assessments was fixed at 10 cents for all ages, and no medical examination was required. As the deaths came in at a rapid rate, those members who had been trained along careful business lines soon realized that the Order could not long exist with such loose methods, and hence an effort was made to change the laws and plans of the society. It was reorganized and incorporated under a special act of the Michigan legislature on 11 June 1881, which date has always been observed as the anniversary of the birth of the organization. This order, up to the year 1902, confined its membership to the State of Michigan, when the Great Camp, the governing body, voted to extend its jurisdiction, and it is now operating successfully in 28 States and Territories. Its present membership is approximately 130,000, 115,000 of whom reside in Michigan, while its ladies' auxiliary body, known as the Ladies of the Modern Maccabees, has about 90,000 members. The Great Camp meets biennially at such place as it may have determined at the previous session. No one but a regularly elected delegate is allowed to vote, no officer of the association being accorded this privilege. Delegates are chosen by county conventions of tents or local bodies, on the basis of 1 for each 300 members. In case the governing body should pass any law that would appear to be objectionable to the members, upon a petition of 5 per cent of the tents the matter must be submitted to a vote of the members in the local organizations, and if it fails of approval there it becomes inoperative. It is claimed that this is the only organization of this character that has its provision in its laws. There is no profit accruing to any one connected with the order, outside of the salaries which the members vote to pay the officers. The plan of collecting assessments is upon the current cost basis, no reserve fund being deemed necessary.

Knights of Malta, Ancient and Illustrious Order of, a secret society founded in Jerusalem, Turkey, and in the United States in 1889. There are now 5 grand commanderies, 233 subcommanderies, and 27,000 members. In 1902 benefits to the amount of $40,000 were disbursed.

Knights of Pythias, a brotherhood organized to disseminate the principles of friendship, charity, and benevolence. The order was founded at Washington, D. C., 19 Feb. 1864, by Justus Henry Rathbone and four associates. An official declaration affirms that «toleration in religion, obedience to law, and loyalty to government» are its three cardinal tenets. The theme upon which the entire fabric of the society rests is the story of Damon and Pythias,— friendship even unto death being a paramount doctrine. The order at present is confined. in its jurisdiction, to the continent of North America; efforts earlier in its history to include the world as its field of action having proved futile. The name chosen, Knights of Pythias, rather than the more historically accurate designation of «Knights of Damon,» was probably due to dramatic license, the reasons for which, like that of poetry, are obscure.

Origin.— The first drama of Damon and Pythias was a comedy, written 1571 A.D. The next effort of record was produced by John Banim,— the Irish poet,— associated with Richard Talor Sheil, who took the liberty of transposing the characters, making Pythias the hostage instead of Damon. This play was a tragedy and was first performed at Covent Garden, London, England, 28 May 1821. It was from the dramatic version of the story of Damon and Pythias that the founder of the order drew his inspiration, and it is the source from which has flowed the great Pythian river,— changing even the name of the society. The introduction, by the Irish poet, of the «fair Calanthe,» the *affiancé* of Pythias, suggests an auxiliary order in which woman might labor with the Knights of Pythias, but no official recognition has ever been accorded to a branch admitting women to membership.

Founder.— Justus Henry Rathbone was born in Deerfield, Oneida County, N. Y., 29 Oct. 1839. He fitted for college at Utica, and became an *alumnus* of Madison University. His father, Justus Hull Rathbone, was a prominent attorney at Utica, N. Y., and his mother came of the famous Dwight family of New England. The original ritual was written during the autumn, winter, and spring of 1858–9, while Mr. Rathbone was a teacher in Michigan. He lived to see the order of the Knights of Pythias firmly established in all its branches,— with a membership of over 300,000. He died 9 Dec. 1889. On 27 July 1898, at Utica, N. Y., a monument raised to his memory was unveiled with imposing ceremonies. This memorial was erected by the order, from the proceeds of a 10-cents-per-capita voluntary contribution.

History.— On 15 Feb. 1864, in Washington, D. C., five clerks of the government met to organize the new order. Their names were: Justus Henry Rathbone, Robert Allen Champion, William Henry Burnett, and his brother, David L. Burnett, and Edward Sullivan Kimball, M.D. Four of these, including Rathbone, were members of the Arion Glee Club of Washington, organized in 1863. Rathbone and Champion were affiliated with the Improved Order of Red Men, the other three did not belong to a civic society. The first enactment recited that «This association shall not be a copy, or imitation, of any existing order, but that it shall be instituted independently, and be intensely American.» The obligation administered was not altogether «in form,» but proved sufficient. The ritual was then read by its author. «This work,» said a survivor, «embodied practically all the tenets of the order of the Knights of Pythias, as now exemplified, although the arrangement was afterward changed somewhat, and its principal features were elaborated.» The four eager auditors heard the dramatic possibilities which have made the society popular, wherever introduced, and parted to meet four evenings later, in a room in F Street, between 9th and 10th, N. W. Each agreed to invite other clerks to be present, it being Rathbone's suggestion that the membership be restricted to this class of employees in the governmental departments. One J. T. K. Plant was to be especially invited, because he belonged to several organizations, and was familiar with their methods and regulations. «Washington Lodge, No. 1, was organized in Temperance Hall, Friday evening, 19 Feb. 1864,» so run the minutes. The number of members is not stated; but, at the close of the year, these had increased to 52. The «founder» was elected worthy chancellor, with associate officers: Vice chancellor, venerable patriarch, worthy scribe, assistant scribe, banker, assistant banker, worthy guide, inside steward, and four choral knights. Evidently the resolution, adopted on the 15th, had not yet gone into effect. The grand lodge of the District of Columbia, was formed 8 April 1864, with J. T. K. Plant as grand chancellor. The other grand officers followed the titles adopted by the subordinate lodge. Franklin Lodge No. 2 was organized at Washington Navy Yard 12 April 1864, and others followed in rapid succession. Then the order waned, until, 1 Aug. 1865, Franklin No. 2 was the only lodge in existence; and it was an acting grand, as well as a subordinate lodge. When the year 1865 closed, the membership in No. 2 was nearly 60. there was a treasury of $200, and the «sole survivor» was in a prosperous condition, notwithstanding a loss of $255.55 through its «banker.» On 1 May 1866 the grand lodge was reorganized, and the order spread to other jurisdictions. When the supreme lodge was constituted, 15 May 1868, the grand lodges of the District of Columbia, Pennsylvania, New Jersey, Maryland, and Delaware were represented. Through many trials, beset at times with disloyalty within and litigation without, from this beginning sprang the great order of the Knights of Pythias.

Government.— This is representative, and threefold, like the society's tenets. It is divided into three departments, namely: Legislative, executive, and judicial. These are regulated by statutes based upon constitutional provisions. In these particulars, and, in its methods of administration, the order has differentiated itself from others of its class. The government is vested in a supreme lodge, the source of all authority in the order; in State and provincial grand lodges, possessing subordinate authority over 10 or more lodges; in subordinate lodges, which create the membership by the acceptance of petitioners, and conferring upon them the ranks of «page,» «esquire,» and «knight.» The supreme lodge was incorporated 5 Aug. 1870, under an Act of Congress approved the previous 5th of May, and many of the grand and subordinate lodges are, also, corporations. The order has, in addition to its three ranks, or degrees, an «endowment» rank, the insurance feature; and a «uniform» rank, the military division,— affiliation with which is voluntary, and predicated on regularity and good standing in the lodge. The titles borne by officers naturally follow the ritualistic structure. In the supreme body, with the prefix «supreme,» these are, a chancellor, vice chancellor, prelate, keeper of records and seal, master of exchequer, master at arms, inner and outer guards. The endowment branch is managed by a board of control, the president of which is a supreme officer; and the uniform rank is commanded by a major-general, who is, also, an elective official. Prefix «grand,» and the first eight become the names of officers of grand lodges. With one or two ritualistic variations, the officers of a lodge bear the same titles, excepting the prefix. Representatives are accorded the honor of «grand» or «supreme» in consonance with the name of the body in which they are elected to take seats. The executives are, respectively, the supreme and grand chancellors, and the chancellor commanders of subordinates. The judiciary consists of tribunes nominated by the executives and confirmed by the legislative bodies. Collectively these constitute the courts of last resort in the supreme lodge, and in grand lodges. Trials in subordinate lodges are conducted by committees. This judicial system has attained the dignity of a settled jurisprudence, the decrees of which are often recognized in actions brought in the civil courts.

Uniform Rank.— The organization of the display branch dates from 1878. The «rank» sprang at once into popularity, and the notable parade at Cincinnati in 1888 served to induce the supreme body to perfect its rules and regulations. Before that year creditable appearances had been made, but then trained soldiers, properly officered, were in line. Since that time the Pythian army has been a regular feature of all assemblages. «Not only this,» says the major-general, commanding, «but the uniform rank has been most cordially welcomed by those outside of the order, and business and professional men, in our towns and cities, take pride in their local companies; while, in military circles, it has been hailed as a worthy addition to the military organizations of this continent.» The ritual is emphatically patriotic; and the offer made to the United States government by this army of disciplined troops, for service in the Spanish-American war, is worthy of note. The powers of this branch are delegated to a supreme assembly,—with a representation in the aforesaid governing bodies,—and the organization follows the lines of the United States army, the «uniformed knights» using the government tactics.

Nomenclature.—Within the recesses of «castle halls,» the terminology of the ages represented by the terms «page,» «esquire,» and «knight,» govern the speech of those assembled. The jurisdictions of supreme and the grand lodges are called «domains,» and all assemblies of the Knights of Pythias, «conventions.» Members address one another as «brother knight.» Documents are dated by the Pythian era, beginning with 1864. To find it, subtract 1863 from the common era. For example· 1903 — 1863 = 40.

Statistics.—The reports for 1903 show 562,327 members, gathered in 6,992 subordinate lodges, governed by 54 grand lodges, and a supreme lodge. The total annual receipts are $7,130,074.32; expenditures for relief, $1,470,129.71; cash on hand, $2,558,039.74; aggregate of lodge assets, $11,109,913.57.

Bibliography.—Carnahan, ‹Pythian Knighthood, its History and Literature›; Van Valkenburg, ‹Jewels of Pythian Knighthood›; ‹Constitutions of the Supreme Lodge Knights of Pythias.›

H. L. Stillson,
Grand Tribune, Vermont.

Knights of the Round Table, the knights of King Arthur, according to some accounts 12 in number, famed for their valor, who sat at a round table in token of their perfect equality. Other versions of the legend give their number as 50 or more. The most famous of them are Lancelot, Tristram, Galahad, and Gawayne. See Arthur; Arthurian Legends; Grail, The Holy.

Knights of St. John and Malta, a secret society founded 1883. It has a grand encampment, 68 subordinate encampments and 3,227 members. Since organization the society has disbursed $551,000 in benefits; and during 1902, the amount was $65,000.

Knights Templars. See Masonic Fraternity, The.

Knightstown, Ind., town in Henry County, on the Blue River, and on the Cleveland, C., C. & St. L., and the Pittsburg, C. & St. L. R.R.'s, 34 miles east of Indianapolis. Near the town are the State Soldiers and Sailors' Orphans' Home. The town has excellent water power, natural gas, flour-mills, torpedo works and other industries, and owns the electric light and waterworks plants. Pop. (1890) 1,867; (1900) 1,942.

Knipe, Joseph Farmer, American soldier: b. Mount Joy, Lancaster County, Pa., 30 Nov. 1823; d. Harrisburg, Pa., 18 Aug. 1901. In 1842 entered the United States army, and served in the Dorr Rebellion in Rhode Island, and subsequently in the Mexican War. At the outbreak of the Civil War he entered the volunteer service and was commissioned colonel of the 46th Pennsylvania regiment in August 1861. In May 1862 he was made a brigadier-general for gallant conduct, and after the War was postmaster at Harrisburg, 1866–9.

Knit'ting, an industrial and ornamental art allied to weaving, but of much later origin. It does not appear to be more than three or four centuries old, and seems to have been first used in the manufacture of stockings. It consists in forming a series of loops with a single thread, through which another row of loops is passed, and so on consecutively. In hand-knitting, steel-wires are used to form the loops on. For manufacturing purposes hand-knitting has been entirely superseded by machinery (see Knitting-machine), which is constantly receiving new improvements. Hand-knitting, however, still forms an agreeable domestic occupation, and also furnishes many women in some parts of the world with means of subsistence.

Knitting-machine. Of the many kinds of knitting-machines in use, one of the best known has a bed-plate with a vertically projecting and grooved needle-guiding cylinder or bed, and which is secured to a table or other suitable support. On the bed-plate is a loose ring with a thread-guide for conducting the thread to the needles, and about the needle-cylinder is a revolving cylinder with an annular groove interrupted by a cam-portion and provided with adjustable cams, which govern the downward motion of the needles, and consequently the length of the loops, and raise the needles; two of these latter cams being needed for reversing the machine for knitting a heel or a flat web. The cam-cylinder is moved by a bevel-gear connected to a driving-crank, and when moved continuously in one direction knits a circular web; and this web may be narrowed as desired, to fashion the leg, by removing needles, and placing their loops on adjacent needles. One needle receives the thread within its hook, and is subsequently moved by the cam-cylinder so as to form the thread so taken into a loop. When the heel is to be formed some of the needles are drawn up, their loops thus being retained and the number of needles left in action corresponds with the width of the heel to be formed. The cam-cylinder is now to be reciprocated in opposite directions, and in order to keep the thread-guide in advance of the descending needles sufficiently far, so that the thread will be caught, pins are inserted in the bed-plate to engage the heel of the thread-carrier and stop it just before the cam-cylinder is stopped.

Knolles, nōlz, or **Knowlles, Richard,** English historian: b. probably Cold Ashby, Northamptonshire, about 1550; d. Sandwich, Kent, 1610. He was graduated at the University of Oxford in 1565, and became master of the grammar school of Sandwich. He wrote a ‹General History of the Turks› (1603), the style of which is highly commended by Johnson, Hallam, and other critics. An improved edition, with continuations, by Sir Paul Rycaut, was published (1687–1700).

Knortz, nôrtz, **Karl,** American miscellaneous writer: b. Garbenheim, near Wetzlar, 28

Aug. 1841. He was educated at Heidelberg University and came to the United States in 1863. He taught in Detroit, Oshkosh, and Cincinnati, 1864–74, edited a German daily in Indianapolis for some years, and since 1892 has been superintendent of German schools in Evansville, Ind. Among his numerous works are: 'Tales and Legends of the North-American Indians' (1871); 'American Sketches' (1876); 'Longfellow' (1879); 'From the Wigwam' (1880); 'Indian Legends'; 'Pictures of American Life' (1884); 'History of American Literature,' in German (1891); 'Individuality' (1897); 'Child Study' (1899). He has very materially assisted in making American authors known in Germany.

Knot, a snipe (*Tringa canuta*) known in its migrations throughout the world, but breeding only in the extreme north, where its pale-green, spotted eggs have been found in only one instance. It appears in small flocks along all shores, and is a favorite with gunners under the names robin-snipe and gray snipe. Its plumage is a mingling of black and white suffused with a reddish tint on the under parts. The book-names refer to its habit of seeking its food just at the edge of the surface, where King Canute is fabled to have seated himself in defiance of the tide.

Knot, a term synonymous for a nautical mile. The log-line is divided by knots (or otherwise) into sections $\frac{1}{120}$ of a geographical mile in length, hence the number of sections run out in half a minute (the 120th of an hour) indicates the number of knots or geographical miles per hour at which the ship is going. The rate at which a vessel sails, or can sail, is usually given in knots per hour, the Admiralty knot or measured mile being 6,080 feet. It is longer than an ordinary statute mile by about one mile in seven; or the nautical mile of 6,080 feet = 1.151 statute mile.

Knot, Black. See Fungi.

Knot-fungus. See Fungi.

Knot-grass. See Grasses.

Knot-root. See Labiatæ.

Knots. See Knotting and Splicing.

Knott, nŏt, **James Proctor**, American legislator and legal scholar: b. near Lebanon, Marion County, Ky., 29 Aug. 1830. He studied law in 1846–51, was admitted to the Missouri bar in 1851, and entered practice at Memphis, Scotland County. In 1858 he was elected to the Missouri legislature, in 1859 was appointed to the office of attorney-general of Missouri to fill a vacancy and in 1860 was elected to that post. Having refused, at the beginning of the Civil War, to take an oath of allegiance which he considered too severe, he was for a time imprisoned in the St. Louis arsenal. In 1862 he removed to Kentucky, where he established himself as a practitioner at Lebanon; and in 1867–71 and 1875–83 served in Congress as Democratic representative from the 4th Kentucky district. He was long chairman of the House committee on the judiciary. In the 41st Congress he made his well-known speech on Duluth, ridiculing the pretensions of the lake town, and gaining a national reputation as a humorist. He was governor of Kentucky in 1883–7, a delegate to the Kentucky constitutional convention in 1891, professor of civics and economics in Centre College (Danville, Ky.) in 1892–4, and from 1894 professor of law and dean of the law faculty of Central University.

Knotting and Splicing, the fastening or tying of ropes or cords. There are hundreds of varieties of knots, most of which are used only on shipboard. Generally the requirements of a useful knot may be stated to be that it should neither «slip» nor «jam,» that, while it holds without danger of slipping while the strain is on it, when slackened it should be easily untied again. The simplest knot is the common one tied on the end of a thread or cord to prevent it slipping. By passing a loop instead of the end of the cord the common slip-knot is formed; and a useful fixed loop is got by tying a simple knot, or the «figure of 8 knot» on the loop of a cord. One of the simplest and most useful running knots for a small cord is made by means of two simple knots. The most secure method of fastening a line to, say, a bucket is the standing bowline; and a running bowline is formed by passing the end through the loop thus making a running loop. Out of the score or so of methods of fastening a boat's painter the one which will be found most useful is the well-known two half-hitches. The timber hitch is useful for attaching a line to a spar or a stone, and the clove hitch is invaluable for many purposes. It is very simple and cannot slip. A simple method of fastening a rope to a hook is the blackwall hitch, where the strain on the main rope jams the end so tightly against the hook that it cannot slip. There are many methods for shortening a rope temporarily, one of them being the sheepshank.

Of the methods for uniting the ends of two cords the simplest and one of the most secure is the common reef knot, which must be carefully distinguished from the «granny,» which will jam if it does not slip; the reef knot will do neither. For very small cords or thread the best knot is the weaver's. The fisherman's knot is a very useful one for anglers, and is formed by a simple knot in each cord being slipped over the other; when drawn taut it is very secure, and it is easily separated by pulling the short ends. A useful method of uniting large ropes is to tie a simple knot on the end of one rope and interlace the end of the other, and draw taut. This tie may also be made with the figure of 8 knot. For very large ropes the carrick bend is the simplest and most secure. The bowline bend is formed by looping two bowline knots into each other. For attaching a small line to a thick rope the becket hitch is very useful.

«Splicing» is the process employed to join two ropes when it is not advisable to use a knot. The three chief varieties of the splice are the short splice, the long splice, and the eye splice. The short splice is made by unlaying the ends of two ropes for a short distance and fitting them closely together; then, by the help of a marlinspike, the ends are laced over and under the strands of the opposite rope. When each strand has been passed through once, half of it is cut away and the remainder passed through again; half of the remainder being also cut away, it is passed a third time, and, when all the strands are so treated, they are hauled taut and cut close. This reducing the thickness of the strands tapers off the splice. The long splice is employed when the rope is used to run through a block, as it does not thicken it. The ends of the two ropes are unlaid for a much longer distance than for the short splice, and similarly placed together. Then one strand is taken and further unwound for a considerable distance, and its vacant place filled up with the corresponding strand of the other rope, and the ends fastened as in the short splice. Other two of the strands are similarly spliced in the opposite direction, and the remaining two fastened at the original joining place. The eye splice is, as the term implies, used to form an eye, or round a dead eye.

To prevent a rope fraying at the ends a variety of methods are employed, the simplest being to serve or whip the end with small cord. Other methods are by interlacing the ends.

Knout, nowt, or noot, the official instrument of punishment formerly used in Russia, made in various forms, but usually being a whip of leather thongs artificially hardened, twisted with wire, etc. One hundred strokes with the knout were considered equivalent to a sentence of death, as the victim seldom survived the infliction.

Knowles, nōlz, **Frederic Lawrence,** American writer: b. Lawrence, Mass., 8 Sept. 1869. He was graduated from Wesleyan University in 1894 and since 1900 has been literary adviser of the Boston publishing firm of Dana, Estes & Co. Beside editing 'Cap and Gown' (1897); 'Golden Treasury of American Lyrics' (1897); 'A Year Book of Famous Lyrics' (1901); and other compilations, he is the author of 'Practical Hints for Young Writers, Readers and Book Buyers' (1897); 'A Kipling Primer' (1900); 'On Life's Stairway,' verse (1900).

Knowles, G. Sheridan, English painter: b. Manchester 25 Nov. 1863. He was educated at private schools and studied art at Manchester and London, working at the Royal Academy Schools from 1884 to 1888. From that date he has actively pursued painting as a profession and has exhibited in the Royal Academy every year. His pictures are popular and romantic genre, and many of them have been engraved. His principal works are: 'The Last Minstrel' (1889); 'The Return from the War' (1892); 'The Wounded Knight' (1895); 'Glasgerion' (1897); 'The Flight of Huguenots from France' (1900).

Knowles, James, English architect and editor: b. 1831. He was educated as an architect and among professional works of his are Tennyson's Surrey home, Aldworth; several churches in Clapham, and the fountain in Leicester Square, London. He originated the Metaphysical Society in 1869, edited the 'Contemporary Review,' 1870–7, and founded the 'Nineteenth Century,' of which he is the editor and proprietor.

Knowles, James Sheridan, Irish dramatist and actor: b. Cork, Ireland, 21 May 1784; d. Torquay, Devonshire, 30 Nov. 1862. He went upon the stage in 1806, but meeting with small success, taught elocution in Belfast and Glasgow. His tragedy of 'Caius Gracchus' was performed at Belfast in 1815 with success, and from this time he had a prosperous career. In 1845 he retired from the stage from scruples of conscience, and in 1852 became a Baptist preacher and published several theological works. In 1849 he received a pension of £200 a year from Government. Among his principal works are the dramas: 'Caius Gracchus' (1815); 'William Tell' (1825); 'Virginius' (1829); 'The Hunchback' (1832); 'The Wife of Mantua' (1833); 'The Love-chase' (1837); 'Love' (1839). In 1847 and 1849 he published two novels, 'Fortescue' and 'George Lovell.'

Knowles, Lucius James, American inventor: b. Hardwick, Mass., 2 July 1819; d. Washington, D. C., 25 Feb. 1884. He became a clerk in a shop at Shrewsbury, Mass., turned his attention to inventing, devised the Knowles safety steam-boiler feed-regulator, and constructed and operated several models of steam-engines. In 1843 he invented a machine for the spooling of thread, and this machine he manufactured at New Worcester in 1843–5. He then built spinning-machines for the manufacture of four- and six-cord thread, and manufactured cotton thread and warps at Spencer and Warren, Mass. (1847–53), and woolen goods at Warren (1853–9). Subsequently he manufactured a safety boiler-feeder, a steam pump, and a tape loom, under his own patents. He was elected to the lower house of the Massachusetts legislature in 1862 and 1865, and in 1869 became State senator.

Knowlton, nōl'tŏn, **Frank Hall,** American botanist: b. Brandon, Vt., 2 Sept. 1860. He was graduated from Middlebury College, Vt., in 1884, was assistant palæontologist on the United States Geological Survey 1889–1900 and palæontologist from the last named date. Among his scientific monographs are: 'Fossil Wood and Lignite of the Potomac Formation' (1889); 'Fossil Flora of Alaska' (1894); 'Catalogue of the Cretaceous and Tertiary Plants of North America' (1896).

Knowlton, Helen Mary, American artist and author: b. Littleton, Mass., 16 Aug. 1832. She studied art under William M. Hunt (q.v.) and Duverneck and has for 30 years taught art in Boston. Beside compiling Hunt's 'Talks on Art,' she has written 'Hints to Pupils in Drawing and Painting' (1879); 'Life of William Morris Hunt' (1899).

Knowlton, Thomas, American soldier: b. West Boxford, Mass., 30 Nov. 1740; d. battle of Harlem Plains, N. Y., 16 Sept. 1776. A farmer at Ashford, Conn., at the beginning of the Revolution, he was elected captain of a militia company organized after Lexington, and with 200 other Connecticut troops was sent to Charlestown. His detachment, ununiformed farmers with shot-guns, fought at Bunker Hill. On 8 Jan. 1776 he made a successful invasion of Charlestown, and subsequently became lieutenant-colonel of a regiment of Connecticut rangers. He was killed while leading his command, at the battle of Harlem Heights, and was highly praised by Washington in general orders.

Know-nothing Movement, The, a secret political association organized in the United States for the purpose of obtaining the repeal of the naturalization law, and of the law which permitted others than native Americans to hold office. It started in 1852 and existed two or three years. The principles of the Know-nothing party were embodied in the following propositions (at New York, 1855): (1) The Americans shall rule America. (2) The union of these States. (3) No North, no South, no East, no West. (4) The United States of America — as they are — one and inseparable. (5) No sectarian interferences in our legislation or in the administration of American law. (6) Hostility to the assumption of the Pope, through the bishops, etc., in a republic sanctified by Protestant blood. (7) Thorough reform in the naturalization laws. (8) Free and liberal educational institutions for all sects and classes, with the Bible, God's holy word, as a universal text-book. A society was formed in 1855 in opposition to the above, called Know-somethings. Both bodies were absorbed into the two parties, Democrats and Republicans, at the presidential election in 1856.

The Know-nothing organization was primarily the result of foreign emigration. In 20 years from 1825 to 1845, the immigration amounted to 1,028,225. The consequence was a sharp awakening of native American prejudice and alarm. The sentiment first showed itself in New York, where the alien population had reached portentous proportions, in the estimation of citizens of the old stock. A native organization for political purposes was effected, and in 1844 it succeeded in electing James Harper mayor on a native American ticket. About this time began the great immigration due to the Irish famine, and in the five years from 1845 to 1850 there came in about as many aliens as had been received during the whole 20 years before. Native Americanism flamed up hotter than ever, and its political conflagration extended to other cities and States. The great volume of the Irish immigration was Roman Catholic, and animosity to that church gave it fire. At Philadelphia two Roman Catholic churches were destroyed in riots between natives and Irish; at Boston a convent was burned. Six native American representatives were elected to the 29th Congress, that of 1845, four from New York and two from Pennsylvania. Between 1850 and 1855 the immigration amounted to nearly 2,000,000; and the native spirit was aroused even more hotly. Moreover, the anti-slavery agitation, expressing itself in opposition to the extension of slavery to the Territories, was disturbing party allegiance, and special efforts were made to kindle the native American spirit into a hot flame, with an ulterior motive, it was believed, of turning the current of public sentiment into other channels.

In 1852 the Know-nothing organization, distinctly, made its appearance. It was so-called because it was a secret oath-bound fraternity, regarding whose objects and whose real name its members always answered when questioned: «I don't know.» «Americans must rule America!» was its rallying cry, and relentless hostility to the increasing power of the Roman Catholic Church and a demand for the extension of the naturalization to 21 years were its main purposes. The Know-nothings started off brilliantly. In 1854 they carried the State elections in Massachusetts and Delaware, and polled a great number of votes in New York. In 1855 they elected governors and legislatures in New York and four New England States, and at the South they were successful or nearly approached success in nine States. In 1856 eight of the 32 States had native American governors, but in the presidential election of that year the party cast only about one fifth of the popular vote and obtained only eight electoral votes, or the votes of the single State of Maryland. In the 35th Congress, 1857, it had 5 senators and 14 representatives. In the next Congress it had 2 senators and 23 representatives, all of them from Southern States. Soon thereafter Know-nothingism went to pieces rapidly and no more of it was heard in politics. It had no representation in Congress after the 36th. See also AMERICAN PARTY.

Knox, nŏks, **Adeline Trafton**, American novelist; daughter of Mark Trafton (q.v.): b. Saccarappa, Maine, 8 Feb. 1845. She was married to Samuel Knox, a lawyer of St. Louis, Mo., in 1889. She has written: ‹Katherine Earle› (1874); ‹His Inheritance› (1878); ‹An American Girl Abroad›; ‹Dorothy's Experience› (1891).

Knox, George William, American Presbyterian clergyman: b. Rome, N. Y., 11 Aug. 1853. He was graduated from Hamilton College, Clinton, N. Y., in 1874, and from Auburn Theological Seminary in 1877. He subsequently was employed in missionary labors in Japan and was professor of philosophy and ethics in the Imperial University of Japan in 1880. On returning to the United States he became pastor of a Presbyterian Church in Rye, N. Y., and was a professor at Union Seminary, N. Y., 1897-9. He has written (in English): ‹A Japanese Philosopher› (1893); (in Japanese) ‹A Brief System of Theology›; ‹Outlines of Homiletics›; ‹Christ, the Son of God›; ‹The Basis of Ethics›; ‹The Mystery of Life›; ‹The Christian Point of View› (1902).

Knox, Henry, American general and cabinet officer: b. Boston, Mass., 25 July 1750; d. Thomaston, Maine, 25 Oct. 1806. He was the 7th son of William Knox, a native of St. Eustatius, West Indies, who settled in Boston and became a shipmaster. After the father's death in 1762, the son was employed by a Boston bookseller, and in 1771 he opened a bookstore of his own. When a young man he threw in his lot with the patriot cause and spent his leisure studying books on the military art, supplementing his reading by observing and questioning the British officers stationed in Boston. His marriage (16 June 1774) to Lucy Flucker, the daughter of an aristocratic loyalist of Boston, did not prevent him from joining the Colonial army at the outbreak of hostilities in the spring of 1775. He fought in the battle of Bunker Hill and then aided in constructing the defenses of the camps around Boston. The army being in pressing need of artillery, Knox proposed to Washington the plan of bringing heavy cannon and stores from Fort Ticonderoga near the Canadian frontier. He set out (15 Nov. 1775) on this perilous enterprise with a squad of mounted men. In the face of great difficulties he succeeded in getting 55 guns, loaded them on sleds, with 2,300 pounds of lead and a barrel of flints, and reached Cambridge in safety (24 Jan. 1776). For this brilliant exploit he was warmly complimented by Washington. After his return he received his commission as colonel of the one artillery regiment, the appointment having been made by the Continental Congress (17 Nov. 1775). The cannonade of

Knox's batteries (on the night of 1 March 1776) enabled General Thomas to take possession of Dorchester Heights, which resulted in the evacuation of Boston by the British forces. In the summer of 1776 he was stationed at New York city with Washington, who found him a true friend and an able officer. In December he was promoted to brigadier-general of the artillery. He distinguished himself in the battles of Trenton and Princeton, and took part in the engagements at Brandywine, German town, and Monmouth. He helped (May 1777) General Greene in planning the defenses of the Hudson River. In the trying winter of 1777–8 he was in camp at Valley Forge, with his young wife. Many of Washington's letters refer to Knox in terms of high appreciation. He rendered valuable service in the operations against Cornwallis in October 1781, his skill as an artillerist being praised by the Frenchman, De Chastellax. He was made major-general (22 March 1782) and appointed to the command at West Point (29 Aug. 1782). Upon him devolved the delicate task of disbanding the army late in 1783. He had already formed the Society of the Cincinnati to keep alive the friendships of officers formed during the war.

Congress appointed Knox Secretary of War (8 March 1785), a position he worthily filled for ten years. In 1794 he was also at the head of the Navy Department, just organized. Owing to insufficient salary, he resigned from Washington's cabinet (2 Jan. 1795). His remaining years were passed at his home in Thomaston, Maine. Consult: Drake, ‹Life and Correspondence of Henry Knox› (1873); Noah Brooks, ‹Henry Knox, a Soldier of the Revolution› (1900).

EUGENE PARSONS,
Editor ‹The World To-day.›

Knox, John, Scottish Protestant reformer: b. Giffordgate, Haddington, Scotland, 1505; d. Edinburgh 24 Nov. 1572. (The society of antiquaries of Scotland discussed the subject of his birthplace in 1858, when Mr. John Richardson of Haddington brought forward evidence that he was born in Giffordgate, a suburb of Haddington, and not in Gifford, a village near that town. He was supported in this view by Mr. Laing, the editor of the reformer's works.) After receiving his preliminary education at the grammar school of Haddington, he went in 1521 to the University of Glasgow, where for several years he studied scholastic philosophy and theology. Noted as a master of dialectic subtleties, he was ordained prior to 1530, and became a teacher of philosophy at St. Andrew's. The study of the fathers, especially of Jerome and Augustine, had shaken his religious opinions as early as 1535, but it was not till 1542 that he became an avowed and marked reformer. The long period of silence, before in mature age he explained his views with completeness, has been regarded as proof that he was naturally of a prudent and peaceful disposition, and not a turbulent partisan, as his after career would indicate. His reprehension of certain practices of the Church caused him to retire from St. Andrews to the south of Scotland, where he was declared a heretic. After the death of his friend George Wishart, he remained in retirement till he took refuge with many other Protestants (1547) in the castle of St. Andrew's, which the regent was vainly attempting to reduce. There for the first time he became known as a powerful preacher against the papacy. The regent, re-enforced by a French squadron, obliged the garrison to surrender. The terms of the capitulation were violated, and Knox with his comrades was transported to France, where he was imprisoned on the galleys for 19 months. He experienced extreme hardships, and on his release (1549) directed his course to England, where he was appointed to preach at Berwick and at Newcastle, and became one of the chaplains of Edward VI. For the boldness of his discourses he was several times called to account, but was able to vindicate himself. A bishopric was offered to him, but he declined it from scruples as to the divine authority of the episcopal order. On the accession of Queen Mary he fled from England to Dieppe, and passed thence to Geneva, where, after taking part in the memorable troubles at Frankfort and after a short visit to Scotland, he became pastor (1556) of a small English congregation. The two years of his residence in Geneva, in the society of Calvin, Beza, and other learned men, were among the happiest of his life. While in Scotland he had been cited to appear before an assembly of the clergy to be held at Edinburgh, and after his return to Geneva the citation was renewed, and he was condemned to be burned as a heretic, and the sentence was executed on his effigy. Against this condemnation he published the ‹Appellation of John Knoxe.› He also wrote a tract entitled the ‹First Blast of the Trumpet against the Monstrous Regiment of Women› (1558), a vehement attack on the political government of women, at a time when Mary of Guise was regent of Scotland and Mary Tudor queen of England, and the nearest in succession to both thrones were females. Invited by the Scottish Protestants to resume his labors in his native country, he landed at Leith in 1559. The queen regent had laid her plans for the forcible overthrow of the reformation. At a convention of the nobility and clergy in Edinburgh all the demands of the Protestants were refused. Several of the reforming preachers were summoned to appear at Stirling for trial, but by the dissimulation of the regent were prevented from attending and then outlawed for their failure. Knox hastened to meet them at Perth, where he preached against the «idolatry of the mass» and the veneration of images. At the conclusion of the service there was a violent outbreak. The images in the churches were demolished, the pictures torn from the walls and trampled under foot, the holy recesses invaded, and the «rascal multitude,» as Knox calls them, did not stop till they had sacked and laid in ruins the houses of the Dominican and Franciscan friars and the Carthusian monastery. The queen regent advanced upon Perth with an army, but, finding the Protestants well prepared for resistance, proposed terms of accommodation which were accepted. The Protestants, in order to consolidate their strength, formed a religious bond or covenant, and began to be distinguished as the congregation, and their leaders as the lords of the congregation. Iconoclasm was a prominent feature in the Scottish reformation. Events similar to those at Perth followed at Stirling, Lindores, Cupar, St. Andrews, and other places. Knox had preached in the cathedral of St. Andrews with such success that the magistrates united with the inhabitants in desolating the churches and monasteries, and in establishing the reformed worship. Meantime civil war raged throughout the kingdom between the regent, assisted by French troops, and the lords of the congregation. In political as well as ecclesiastical affairs Knox was a conspicuous adviser, and took up his residence in Edinburgh after an extensive circuit through the southern and eastern counties. After a contest of 12 months, the vigorous assistance rendered by Elizabeth, and the death of the queen regent while the English troops were investing Edinburgh led to a truce and to the summons of the Parliament to settle differences. Parliament assembled in August 1560, the reformed religion was established, and Roman Catholicism interdicted by law in Scotland. Soon after the arrival of the young Queen Mary (21 Aug. 1561) she summoned the influential and noted reformer to her presence. Six interviews are recorded between him and the queen, and the questions which she raised were discussed by him with a rude vehemence and rigor, which once drove her to tears. She caused his arrest on a charge of treason in 1563, but all the councillors except the immediate dependents of the court voted for his acquittal. The vehemence of his public discourses led him into frequent difficulties. In 1562 he disputed publicly for three days with Abbot Quentin Kennedy at Maybole; in 1565 he quoted certain texts which gave offense to the court, and was for a short time prohibited from preaching. He fled from Edinburgh when the queen returned from Dunbar after the death of Rizzio; and he preached a sermon at the coronation of the infant king at Stirling (29 July 1567). Under the brief regency of Moray, the work of Knox seemed to be completed, but after the assassination of Moray, civil and religious confusion returned under the regency successively of Lennox and Mar. Weakened by a stroke of apoplexy in 1570, Knox yet reappeared in the pulpit, but so violent was the enmity excited by his animadversions that he left Edinburgh for St. Andrews 5 May 1571. He returned in the following year, and his last energies were put forth in denunciations of the perpetrators of the massacre of St. Bartholomew's.— The doctrines of Knox embraced a Calvinistic creed and a Presbyterian polity. The «Order of Geneva,» a liturgy which he shared in preparing for the use of the church at Frankfort, and subsequently employed in his congregation at Geneva, was introduced into Scottish Protestant churches in 1565. His character was marked by a stern realism, which could be beguiled by no social pretensions, no conventional dignities, no pompous traditions. From this sprang his scornful bitterness and his insensibility to the social graces and refinements which Mary exhibited. He was not a thinker except on political topics. His 'History of the Reformation of Religioun in the Realme of Scotland' is the best known of his writings. Consult: 'Lives,' by McCrie (1813); Taylor (1885); P. H. Brown (1895); Lorimer, 'John Knox and the Church of England' (1875); Carrick, 'John Knox and his Land' (1902).

Knox, John Jay, American financier: b. Knoxboro, N. Y., 19 March 1828; d. New York 9 Feb. 1892. He was graduated at Hamilton College in 1849, and was a banker till 1862. In that year he received an appointment from Secretary Chase, and subsequently had charge of the mint coinage correspondence of the Treasury Department, becoming in 1867 deputy comptroller of the currency. A bill which he proposed was passed with a few modifications, and is known as the Coinage Act of 1873. In 1872 he was appointed comptroller of the currency, resigning in 1884, to become president of the National Bank of the Republic, New York. In addition to various Reports, he published 'United States Notes' (1884, revised 1887).

Knox, Philander Chase, American lawyer and politician: b. Brownsville, Pa., 4 May 1853. He was graduated from Mount Union College, Ohio, in 1872; studied law and was admitted to the bar in 1875. He was assistant United States district attorney for the western district of Pennsylvania in 1876–7; resigning this position he took up the practice of law in Pittsburg in partnership with J. H. Reed. The firm's practice grew rapidly, and Knox became known as one of the most successful corporation lawyers in the United States; in 1892 he was counsel for Carnegie during the Homestead strike. April 1901 he was appointed attorney-general of the United States. In this office he has necessarily been involved in the «anti-trust» agitation; he has dealt with the question from a purely lawyer's standpoint, and in 1902 brought suit against the Northern Securities Company and the so-called «Beef Trust» on the ground that they were violating Federal statutes, seeking in this way to test and enforce the laws for controlling large combinations of capital.

Knox, Thomas Wallace, American journalist and traveler: b. Pembroke, N. H., 26 June 1835; d. New York 6 Jan. 1896. He went to Colorado in 1860 and there engaged in journalism, and during the Civil War served as volunteer aide. He made a journey around the world as a newspaper correspondent in 1866 and again in 1877, and wrote many popular books for young people. Among his very numerous published works are: 'Underground Life' (1873); 'How to Travel' (1880); 'Boy Travelers Series' (15 vols. 1880–94); 'Lives of Blaine and Logan' (1884); 'Decisive Battles since Waterloo' (1887); 'The Lost Army' (1894); 'Hunters Three' (1895); 'In Wild Africa' (1895); etc.

Knox College, a coeducational institution, founded in 1837 at Galesburg, Ill., as Knox Manual Labor College. The school was opened in 1841, and in 1857 the name was changed to Knox College. The original plan for founding and maintaining the school was to secure subscriptions to the amount of $40,000 and to purchase lands in the Mississippi Valley, at government price, the lands to be resold at a profit. Every subscriber who purchased 80 acres of land was given free tuition for one student for 25 years. In 1902 the productive fund amounted to about $250,000. The tuitions and other fees amounted to $14,526; the income from the productive funds and other sources was nearly $15,000. There are in the library about 10,000 volumes. In 1903 there were connected with the school 35 instructors and professors; and 700 students. A music department was established in 1883. The famous Lincoln-Douglas debate, in 1858, was held on the grounds of this college.

Knox-Little, William John, English Anglican clergyman and author: b. Stuartstown, County Tyrone, Ireland, 1839. He was educated at Cambridge University, took orders in the English Church, and after holding several curacies was rector of St. Alban's, Cheetwood, Manchester, 1875–85. Since 1885 he has been canon residentiary of Worcester Cathedral and vicar of Hoar Cross. He is an «advanced» churchman and has several times visited the United States, where he has preached in many Episcopal churches conspicuous for High Church leanings. He is a popular religious writer, and among his many books are: 'Meditations on the Three Hours' Agony of Our Blessed Redeemer' (1877); 'The Broken Vow: a Story' (1887); 'The Child of Stafferton' (1888); 'The Perfect Life' (1899); 'Studies on South Africa' (1899); 'Holy Matrimony' (1900).

Knoxville, nŏks'vĭl, Iowa, city and county-seat of Marion County, on the Chicago, B. & Q., and on the Chicago, R. I. & P. R.R.'s, 35 miles southeast of Des Moines. Here is the State Industrial Home for the Blind, court house, high school and public library. It is the centre of an extensive coal-mining, stock-raising and agricultural district, and has flour-mills, canneries and machine shops. Pop. (1890) 2,632; (1900) 3,131.

Knoxville, Tenn., city, county-seat of Knox County; on the Tennessee River, and on the Knoxville & A., the Knoxville, C. G. & L., the Southern, and the Atlanta, K. & N. R.R.'s; about 110 miles northeast of Chattanooga. It is connected with South Knoxville, on the south side of the river, by a magnificent steel bridge. The site is a picturesque one, being near the centre of the valley between ranges of the Alleghany and Appalachian Mountains, which are visible from several points in and about the city. It is built on a series of sloping hills and their intervening valley-like spaces; the average elevation above the sea-level being about 1,000 feet. It is the commercial centre of a large area of territory, embracing, besides the eastern division of Tennessee, also western North Carolina, southwestern Virginia, North Georgia, and a large part of eastern Kentucky. The rich coal fields which furnish so large a proportion of the fuel supply for the Southern States are from 25 to 60 miles distant from Knoxville. These are the Coal Creek and Jellico districts, and the operators of a majority of these mines have their headquarters in Knoxville.

History.—Knoxville was founded in 1791, by Gen. James White, who had been an officer in the American army in the War for Independence. It was named in honor of Gen. Knox, of Revolutionary fame, the first secretary of war. The first building, a block house, was erected for the protection of the pioneer settlers against the attacks of Cherokee Indians. For a number of years Knoxville was a government military post, barracks being erected for the accommodation of those in the military service. In those days Knoxville was the centre of interest in connection with Indian depredations so common in the settlement of Tennessee.

Trade and Manufactories.—For more than a third of a century Knoxville has been doing a large wholesale business. Wholesale merchants have reached out for additional markets into all the surrounding States. It has good shipping facilities and a branch of the Louisville & Nashville road, about 65 miles in length, is being built and when completed will give the city additional direct connection with the Northwest. During two thirds of the months of the year small steamboats ply on the Tennessee and French Broad rivers, above and below the city and do a large amount of local business. The growth in the number and the capacity of manufacturing establishments in the past decade has been very marked. More than 28 per cent of the entire population of the city is engaged in manufacturing. The chief manufactures are woolen and cotton goods, furniture and cabinet mantels, marble sawed and polished, bar iron, boilers, stoves, castings, coffins and caskets, iron fencing, ready-made clothing, beer, desks, and flour. The woolen and cotton factories, the marble works and the flour mills are large establishments. The growth of small manufactories in the past ten years is a feature that is attracting attention. The marble which is found in quarries at the very gates of the city is used for ornamental purposes in almost every large public or private building being erected in any part of the United States, and the hardwood cabinet mantels being manufactured here are sold in almost every State in the Union. The great abundance and close proximity of raw material — timber, a large number of varieties: coal, iron ore, marble, and zinc, make the place desirable as a manufacturing site.

Climate.—The near proximity of the tall mountains on either side, almost surrounding the valley of which Knoxville is so nearly the geographical centre, does much to modify climatic conditions, and to render them different from those of other cities situated in about the same latitude. The city and surrounding country has been comparatively immune against destructive storms. The average mean annual temperature for a period of 25 years, as shown by the local records of the Government Weather Bureau, is 57°, the mean summer temperature 74°; mean winter 40°; mean spring 57°; mean autumn 58°. The temperature in winter has occasionally gone as low as zero, slightly below, but has continued only for a short time. The maximum mid-day summer temperature has gone as high as 100°, but as a rule the nights are cool.

Banks.—There are eleven banks in the city, five of them national banks. Their combined capital is $1,050,000, with $472,000 surplus and undivided profits. The transactions of the clearing-house have trebled in the past ten years, and during the present year (1903) have averaged over a million dollars weekly.

Churches and Schools.— There are 42 churches in the city for the white population and 17 for the colored. All but one of these are Protestant. The leading denominations, reckoning on the basis of the number of communicants, are the Methodists, Baptists and Presbyterians, in the order mentioned. There are two Protestant Episcopal, three Christian, and two Lutheran churches. It is the seat of the University of Tennessee, the East Tennessee Female Institute, the Tennessee Normal College, the University (preparatory) School, and Saint Mary's Academy. The Knoxville College, for colored students, founded and maintained by the United Presbyterian Church, is located here. The public schools have ten buildings for the white children, and four for the colored. About 100 teachers are employed. The school session is nine months in the year at an average annual cost of about $55,000. The State School for Deaf Mutes is located in Knoxville, also the Lyons View branch of the State Hospital for the Insane.

Benevolent Institutions.—Among the chief of these is the Industrial School for Juveniles, sustained at the expense of Knox County, capable of housing and giving instruction to 200 girls and boys; the Home for Aged Women and an orphanage. The Knoxville General Hospital was erected at a cost of more than $50,000, and is one of the leading institutions of its kind in the South.

Government.—The city is governed by a mayor and board of aldermen elected by the people for the term of two years, and a board of public works elected in the same manner. The assessed value of property for taxation is $14,000,000 which is not exceeding 75 per cent of its actual value. The bonded debt of the city is $1,200,000, most of which was created for paving streets, constructing sewers, building bridges, and other public improvements. The city is supplied with pure wholesome water, from the Tennessee River, by a private corporation which owns the water plant. The lighting plants, gas and electric, are also owned by private corporations.

Population.—The population by the census of 1900 was 32,637; in 1890 it was 22,535; in 1880 9,663; in 1870 8,682. In 1900 the colored population numbered 22.5 per cent of the whole and the foreign population 2.7. The increase in recent years has been very rapid, and it is claimed now (1903) with good reason, that the population of the city and close in suburbs, not embraced in the municipal limits, is at least 60,000.

Wm. Rule,
Editor Knoxville 'Journal and Tribune.'

Knurr-and-Spell. See Nur-and-Spell.

Knyphausen, knĭp'how-zĕn, Baron **Wilhelm von,** German soldier: b. Lützberg 4 Nov. 1716; d. Cassel 7 Dec. 1800. Educated at Berlin, he entered the Prussian army in 1734, in which he became in 1775 a general officer under Frederick II. (the Great). He came to the United States in that year as second in command of the Hessians in the English service, and superseded Gen. von Heister as commander-in-chief in 1777. He fought at Long Island, White Plains, Brandywine, and Monmouth; and during the temporary absence of Clinton in 1780, commanded New York. In 1782 he returned to Germany, where he later became military governor of Cassel. He was a capable soldier, and had no high opinion of his unreliable mercenaries.

Koa'la, a remarkable marsupial (*Phascolarctos cinereus*) of the family *Phalangeridæ*, found chiefly in the interior of New South Wales, and known to the colonists as «native bear.» It is about two feet long, and has a heavy, depressed, somewhat bear-like form, no tail, strong limbs with five digits armed with long claws on each, the inner digit on the hind feet and two inner on the fore feet opposable to the others, the ears large and like the rest of the body covered with a dense gray woolly fur. These characteristics fit it for an arboreal existence, and it lives altogether in trees, descending only occasionally to dig for roots. It is especially active at night and feeds on leaves and buds of eucalyptus trees. It is timid and defenseless, and is killed with clubs by the Australian blackfellows, who eat its flesh. Compare Wombat, and consult authorities cited under Marsupialia.

Kobbé, kŏb'bā, **Gustav,** American author and journalist: b. New York 4 March 1857. He was graduated at Columbia University in 1877, and at its Law School in 1879; and has since been employed in newspaper and magazine work. He has published: 'The Ring of the Nibelungen' (1889); 'Wagner's Life and Works' (1890); 'My Rosary and Other Poems' (1896); 'New York and Its Environs' (1891); 'Plays for Amateurs' (1892); 'Miriam' (1898); 'Opera Singers' (1901); 'Signora, a Child of the Opera House,' a novel (1902).

Kobbe, kŏb, **William A.,** American general: b. New York 10 May 1840. He was educated in Germany till 1862 and was graduated from West Point in 1873. He served in the Civil War in the 7th New York regiment and rose to the rank of captain. In the war in the Philippines he was placed in command, in January 1900, of an expedition to the southern extremity of Luzon, and in March following was appointed military governor of the Province of Albay (Luzon), and Catanduanes Island, and temporary governor of the islands of Samar and Leyte. On the reorganization of the regular army in February 1901, he was appointed one of the new brigadier-generals.

Kobé, kō'bĕ, Japan, a treaty port and former municipality of the main island Hondo, on the west shore of the Gulf of Osaka, adjoining on the northeast the prefectural city of Hiogo (q.v.), with which it was united in 1892. It is the most important of the treaty ports with the largest trade, a fine harbor, docks, wharves for ocean steamers, ship-building yards, railway shops and other important industrial establishments. Kobé is well laid out with wide streets, electrically lighted. Pop. (1898) 215,780.

Ko'bold, a species of elf in the popular superstition of Germany, corresponding to the English *goblin*. The kobold is connected with a house or a family, and appears in bodily shape.

Koch, kōh, **Robert,** German bacteriologist: b. Klausthal, Hanover, 11 Dec. 1843. He received a medical education at Göttingen (1862–6), was assistant-surgeon in the Hamburg general hospital, was in private practice at Langenhagen (Hanover), Rakwitz (Posen), and Wollstein (Posen), and in 1872 was appointed to the Imperial board of health. In 1882 he succeeded in isolating the tubercle bacillus, in 1883 was made privy councillor and became director of the cholera commission to India and Egypt. He discovered in 1884 the cholera spirillum, or comma bacillus, regarded as a positive test of the presence of Asiatic cholera. For this service he received by legislative act a gift of 100,000 marks ($25,000). In 1885 he was appointed professor in the University of Berlin, director of the newly established Hygienic Institute of Berlin, and also director of the Prussian board of health. He announced in 1890 the discovery of a substance called tuberculin, which, he asserted, would cause to cease the growth of the tubercle bacillus.

Subsequent experiment failed in the judgment of scientists to confirm his claim in connection with the treatment of human beings. Among his writings are: ‘Beitrag zur Aetiologie der Tuberkulose’ (1882); ‘Ueber die Cholerabakterien’ (1884); and ‘Weitere Mitteilungen über ein Heilmittel gegen Tuberkulose’ (1890).

Kock, Charles Paul de, shärl pōl dė kŏk, French novelist: b. Passy, France, 21 May 1794; d. Paris 29 Aug. 1871. He was the son of a Dutch banker who was guillotined in 1794. At 15 he was placed in a banking-house, but presently took to writing, and his reputation was soon established by such works as ‘Georgette’ (1820); ‘Gustave, ou le mauvais Sujet’ (1821); ‘Mon Voisin Raymond’ (1822). The last is regarded as the typical romance of its kind. His scenes are cast in the lower ranks of middle-class life. His narrative is a constant succession of stirring incidents without catastrophe. The incidents are always gay and lively, frequently somewhat gross, but scarcely to the extent of indecency. The worst feature of Paul de Kock's works is his style, which is barely presentable, a fault evidently due to deficiency of education. This accounts for his popularity being greater abroad than at home, as the defects of style disappear in translation. Besides his novels, which are very numerous, he wrote several dramas, chiefly taken from them. Consult: Trimm, ‘La Vie de Charles Paul de Kock’ (1873).

Ko'dak, a portable photographic camera of special type for taking instantaneous negatives. It is made in the form of a small box having a lens and a shutter in one side and a reflector on top by which the operator can focus the lens. When this has been done a button is pressed and the snap-shot is taken. The kodak is provided with a continuous roll of sensitized film on which successive negatives can be made.

Koehler, kė'lėr, **Robert,** American artist: b. Hamburg, Germany, 28 Nov. 1850. He came with his parents to the United States in 1854; was educated at Milwaukee, Wis., and learned lithography which he practised in Pittsburg, Pa., and New York. After studying drawing in the night classes of the National Academy of Design, he went to Munich where he learned painting under Loeftz and Defregger and chose genre as his special field of activity. His principal pictures are: ‘Holiday Occupation’; ‘Her Only Support’; ‘The Socialist’; ‘The Strike’; ‘The Family Bible’; and ‘Father and Son.’ Since 1893 he has been director of the Minneapolis School of Fine Arts.

Ko'el, one of a group of East Indian and Australian fruit-eating cuckoos, of the genus *Eudynamis*, which are popularly known as «rain-birds.» They are parasitic, but have many peculiarities; among which are the glossy black plumage of the males, and the fact that, contrary to the rule, the immature young resemble the males instead of the females, which have a reddish dress. A Philippines species (*E. mindanensis*) is locally called «phow.» They utter loud whistling cries.

Kogia, kō'jĭ-ạ, the generic and ordinary name of the «pigmy» sperm whales of the Pacific, which differ from the true sperm whales (q.v.) in anatomical particulars, and conspicuously in size, not exceeding about 15 feet in length. There are several species of these cetaceans which belong mainly to the New Zealand region, although one species visits the coast of California, but they are little known.

Koh-i-Nûr, kō'ē-noor', or **Kohinoor.** See Diamond.

Kohl, Johann Georg, yō'hän gā'ōrg kōl, German traveler and historian: b. Bremen 28 April 1808; d. there 28 Oct. 1878. Nearly his entire life was devoted to travel and historical investigation in Europe and in North America, where he spent four years and published as the fruits of researches: ‘Travels in Canada’ (1855); ‘Travels in the Northwestern Parts of the United States’ (1857); ‘History of the Discovery of America’ (1861); and several essays on American cartography. Other works are: ‘Travels in the Interior of Russia and Poland’ (1841); ‘The British Isles and Their Inhabitants’ (1844); ‘The Rhine’ (1851); ‘The Danube’ (1853).

Kohl-Rabi, kōl-rä'bĭ, a botanical variety of the same species as cabbage (q.v.), from which it differs in the swelled, turnip-like stem with a tuft of loose leaves on the top. This bulbous stem, which may be six inches in diameter, is used for human and stock food, less in America than in Europe. Its quality and texture are less agreeable, except in very young plants, than are those of turnips and cabbage.

Kohler, ko'lėr, **Kaufmann,** American rabbi: b. Fürth, Bavaria, 10 May 1843. After completing his studies at the universities of Munich, Berlin, and Leipsic, he was chosen as rabbi in Detroit in 1869, and two years later elected rabbi of Temple Sinai, Chicago, where he introduced Sunday lectures, a novelty in those days. In 1879 he was called to Temple Beth El, New York. At his initiative in 1885 a rabbinical conference was held at Pittsburg, Pa., which formulated a platform for Reformed Judaism. In later years he frankly receded from the radical standpoint and assumed a more conservative position. In 1903 he was elected president of the Hebrew Union College. He has been a frequent contributor to the Jewish press, and in addition to various volumes and critical papers has written: ‘Der Segen Jakobs’ (1868), and a ‘Guide to Instructions in Judaism’ (1900).

Kohlsaat, kōl'sät, **Herman Henry,** American publisher. He was educated in the public schools of Chicago and Galena, Ill., and after acting as traveling salesman for several years for Chicago firms, became in 1880 a junior partner in a wholesale bakery. He subsequently acquired a fortune in the bakery business and other enterprises, and in 1891 became part owner of the *Inter-Ocean* of Chicago, and in 1894 owner of the Chicago *Times-Herald,* now *The Record-Herald,* and of the Chicago *Evening Post.*

Koko-nor, kō'kō-nôr', or **Kuku-nor,** a lake in Tibet, not far from the Chinese province of Kan-su. It lies 12,097 feet above the level of the sea. Its very salt waters, exquisitely blue in color, cover 66 miles by 40. It contains five islands, one with a Buddhist monastery.

Kokomo, Ind., city, county-seat of Howard County; on the Wildcat River, and on the Toledo, St. L. & K. C., the Pittsburg, C., C. & St. L., and the Lake Erie & W. R.R.'s; about 55 miles north of Indianapolis. It was settled in 1844 by

Daniel Foster, incorporated as a town in 1845 and chartered as a city in 1855. Kokomo is located in a region of good farms, but it is a manufacturing and commercial city. The chief manufacturing establishments are plate, opalescent and table glass works, potteries, steel-mills, a fibre-bond mill, stove works, rubber works, automobile factories, bit works, pulp- and paper-mills; all employing about 7,500 men. There are seven churches, a classical school, a high school, public and parish schools, and a public library. The three banks have a combined capital of $300,000. The government is vested in a mayor and 10 councilmen, elected biennially. Pop. (1890) 8,261; (1900) 10,609; (1903) 17,000, of which about 1,500 are Germans; 1,000 French, and 1,000 Irish.

J. A. Kantz,
Editor of ‹Kokomo Tribune.›

Ko'la-nut. See Cola-nut.

Kol'berg. See Colberg.

Kolb's Farm, Engagement at. After the action at Pine Mountain (q.v.), 15 June 1864, Gen. Sherman closed in on the Confederate army defending Marietta and the railroad south to the Chattahoochee, and began the extension of his lines to the right. The Confederates made a corresponding move to the left, and on the night of the 21st Hood's corps of two divisions, Hindman's and Stevenson's, moved from the right, near the railroad north of Marietta, to the Marietta and Powder Springs road, near Zion Church, about four miles southwest of Marietta and a mile east of Kolb's Farm. Hood now occupied the extreme left of the Confederate line, and had been instructed by Gen. J. E. Johnston to endeavor to prevent any progress of Sherman's right toward the railroad, the course of which was nearly parallel to the Confederate left and centre, and which was seriously menaced by Hooker's and Schofield's corps. On the morning of the 22d Schofield had advanced one division, Hascall's, on the road from Powder Springs Church to Marietta, with orders to take position on Hooker's right, near Kolb's house. Hooker, in going to the right and forward, reached to the Marietta road at Kolb's, and made connection with Hascall's division. Williams' division, massed by brigades, held Hooker's right, Geary's division was on the left of Williams, and Butterfield's division was further to the left on the line of Howard's Fourth corps. Williams and Hascall had very sharp skirmishing in getting into position, and from prisoners taken of Hood's corps it was learned that Hood, supported by Hardee, was about to attack, upon which both Williams and Hascall were ordered to deploy their divisions, and they threw up breastworks, Hascall in heavy woods, and Williams, for the greater part, on open, commanding ground, giving good positions for artillery. The deployment had not been completed and but few breastworks had been thrown up when, about 5 p.m., Hood made his attack. As he advanced from the woods which had sheltered him and concealed his line, his right was met by a terrific fire of shell, case-shot, and canister, that tore great gaps in the line and partially broke up his formation; but he pressed on and, coming under still closer canister fire and deadly volleys of musketry, was repulsed after a most desperate struggle of less than an hour. The attack fell upon the divisions of Williams and Hascall, Williams losing only 130 killed and wounded, and Hascall a less number. Hood's loss was 1,012 killed and wounded and about 100 missing. Consult: ‹Official Records,› Vol. XXXVIII.; Cox, ‹Atlanta›; Johnston's ‹Narrative.›

E. A. Carman,

Kol'lock, Mary, American painter: b. Norfolk, Va., 20 Aug. 1832. She studied at the Academies of New York and Philadelphia, as well as in the Julian school at Paris. In 1877 she was elected instructor in painting to the Ladies' Art Association of New York. She has been industrious in filling many canvases with her graceful landscapes and simple genre groups, and her latest works include: ‹Road in Normandy›; ‹The Italian Brigand›; ‹Washing in Pont-Aven, France›; and ‹The Gossips.›

Kolmar, kōl'mär, Germany, city and capital of Upper Alsace, formerly in the French department of Haut Rhin, 39 miles south of Strasburg. Its fortifications were destroyed in 1673, and it is now surrounded by boulevards, and entered by three gates. Here is the public library with 36,000 volumes, and some pictures by Schön, Albert Dürer, etc.; and the museum, where, among other curiosities, a remarkable aërolite is preserved, which fell near Ensisheim in 1492, and originally weighed about 284 pounds. The portion here weighs about 142 pounds. Kolmar has manufactures of printed goods, calicoes, silks, etc., besides cotton-spinning mills, tanneries, and chamois-leather works. It has a considerable trade in the manufactured goods of Alsace, and in iron, grain, wine, madder, etc.; and in colonial produce, with which it supplies Switzerland. In 1552 Kolmar was surrounded by walls and towers, and made an imperial free town. In 1632 it was taken by the Swedes, who maintained possession for two years. It was united to France in 1697 by the Peace of Ryswick, and surrendered to Germany by the Treaty of Versailles, 26 Feb. 1871. Pop. (1890) 30,411; (1900) 36,736.

Kolyma, kō-lē'mä, a river of Siberia, in the government of Yakutsk, which rises in the mountains of Stanovoi-Krebet. After a course of about 1,000 miles it falls into the Polar Sea. The chief tributaries are the Greater and the Lesser Aniuj and the Omolon, which enter it on the left not far from the sea. Afterward the river divides into two, and subsequently into three branches, forming a delta. The Kolyma has sufficient depth for any vessel, but navigation, especially at the entrance, is rendered dangerous by shifting sand-banks.

Kongo, kŏng'gō, or **Congo, Free State,** an independent State in Central Africa, constituted in 1885. It is bounded northwest and north by French Kongo and British East Africa, the dividing line being partly the Kongo itself and its tributary the Ubangi; on the east it is bounded by British East Africa, German East Africa, Lake Tanganyika, and British Central Africa; on the south by the Portuguese and British territories. It reaches the Atlantic at the mouth of the Kongo by a narrow neck of land. The territory has an area of about 900,000 square miles, and is divided into 15 administrative districts, namely, Banana, Boma, Matadi, the Falls, Stanley Pool, Kwango, Oriental, Kassai, Lake Leopold II., Bangala, Equator, Ubangi, Welle, Stanley Falls, Aruwimi, and Lualaba, each of these districts being under a commissioner. The northeastern portion of the State, forming fully one third of the whole, is mostly under dense and almost impenetrable forest, but the remainder largely consists of arable land of considerable fertility. Among the cultivated plants are maize, millet, manioc, tobacco, coffee, sugar-cane, hemp, bananas, etc., and most of the fruits and vegetables of Europe have been found to thrive excellently. The wild animals include the elephant, hippopotamus, crocodile, buffalo, antelopes of various kinds, the chimpanzee, soko, etc. The imports consist mostly of woven goods, spirits, tobacco, and firearms, and the exports comprise ivory, rubber, ground-nuts, palm-oil, gum-copal, wax, etc. The climate is very unhealthful to white men, owing to the combination of great heat with a very moist atmosphere, but in a few of the more elevated spots it is much better. There are two rainy seasons, namely, October-December and February-May, the latter being much the wetter, and between these intervene the two dry seasons. There are not as yet many good roads in the State, but there are thousands of miles of navigable rivers. The Kongo is navigable from the sea up to Matadi, and again for 1,000 miles between Stanley Pool and Stanley Falls, but the portion between Matadi and the Pool is obstructed by cataracts. A railway has, however, been opened between these two places. The bulk of the inhabitants are of Bantu stock, but in the extreme north the proper negro type is found, and in some of the eastern parts of the State Arabs and other ethnical groups occur. Large numbers of the inhabitants are cannibals of the most pronounced type, and the vast majority are heathens.

After Stanley had proved the identity of the Lualaba with the Kongo, a Comité d'Etudes du Haut Kongo was formed under the auspices of Leopold II., king of the Belgians; and in 1879 this body commissioned Stanley to return to the Kongo region with a view to preparing for the development of its resources. He established his first station at Vivi, and afterward founded others at Isangila, Manyanga, Leopoldville, Equatorville, Stanley Falls, and elsewhere, several of these being connected by good roads. In 1884 the African International Association replaced the committee, and in the following year it secured the foundation of the Kongo Free State and the recognition of its independence by the Congress of Berlin. Trade and navigation on the Kongo and all the rivers, lakes, and canals connected with it were declared absolutely free, and the suppression of the slave-trade was provided for. Leopold II. was made sovereign, and Brussels was named as the seat of the government. In 1889 Leopold bequeathed his sovereign rights to Belgium. In 1890 the territories of the State were declared inalienable, and in that year also the right was reserved to Belgium of annexing it after 10 years. This convention expired on 3 June 1903, when the Belgian government decided to abandon the project of annexation, allowing the option to expire, the reasons given being popular opposition and the attitude of Great Britain. The central government, located at Brussels, comprises the king of the Belgians as sovereign, and a secretary of state, etc. At Boma there is a governor-general, under whom of course there are numerous officials. There is an army of native Africans, having an effective strength of about 16,000, commanded by European officers. Besides Boma, the capital, the chief stations are Banana, Matadi, Vivi, Isangila, Manyanga, Leopoldville, Mswata, Kwamouth, Bolobo, Lubolela, Equatorville, Bolombo, Stanley Falls, Nyangwe, Yambuya, Basoko, Benabendi, etc. Pop. estimated at from 14,000,000 to 30,000,000; number of Europeans (1898) 1,678 — mostly Belgians.

Kongo, or **Congo, River,** Africa, a large river in southwest Africa, flowing into the Atlantic Ocean in lat. 6° S.; lon. 12° 40′ E. Its estuary was discovered by the Portuguese, Diego Cam, in 1482; and the lower part of its course was first explored by Capt. Tuckey in 1816. The upper part of the river remained unknown till Stanley, by descending from Nyangwe on the Lualaba to the mouth of the Kongo (1876–7), proved the two rivers to be identical. The Kongo is formed by the junction of the Luapula and the Lualaba in about the same latitude as the mouth. Of these the former issues from the south end of Lake Bangweolo, bends northward, and flows into Lake Moero, on leaving which it pursues a northwesterly course. The chief inflowing river of Bangweolo is the Chambezi, which enters the lake on the east after flowing southwest from the mountains of northeastern Rhodesia. The Lualaba rises by several headstreams in the south of Kongo Free State and flows north and north-northeast through a series of lakes to its junction with the Luapula. The river thence flows north and slightly west to Nyangwe, receiving the Lukuga on the right from Lake Tanganyika, thus being connected immediately with the great lake system of Central Africa. It then follows a northerly course for about four degrees, near the equator turns to the northwest and holds that direction till it reaches about lat. 1° 45′ N., when it turns first west and then gradually southwest. About the place where the river first crosses the equator there are seven falls, called Stanley Falls; and about lon. 17° E. and lat. 2° 30′ S. there begins a series of cataracts and rapids. In this part of its course it receives some very large tributaries, the most important of which are the Aruwimi, the Rubi, the Mongalla, and the Mobangi (or Ubangi), which join it on the right, and the Boloko, Lopori, Ikelemba, Ruki, and Kwa, which join it from the left, the latter representing the collected waters of the Kassai, the Kwango, Sankuru, etc. Below the Livingstone Falls, near Stanley Pool, the course of the river, which is there contracted, again expands, till at its mouth it attains a breadth of 10 miles. It is navigable for about 110 miles from its mouth up to the cataracts, and above Stanley Pool steamers ply for about 1,000 miles. The amount of water which the river discharges is greater than that discharged by the Mississippi, the volume of water being next to the Amazon. The length of the river is estimated at 3,000 miles, and the area of its basin is about 1,600,000 square miles. Consult: Stanley, ‘Through the Dark Continent’ (1878).

Kongo-snake, one of the slender amphibians of the family *Amphiumidæ*, which take an intermediate place between the cœcilians and the salamanders as the lowest family of the tailed (urodelous) amphibians. Several genera occur in Asia and North America. The giant "salamander" (*Cryptobranchus maximus*) of the mountain-streams of Japan sometimes more than five feet long, and the American hellbender (q.v.) are of the same family. The term «Kongo-snake,» however, belongs specifically to the typical genus and species, *Amphiuma means,* which inhabits suitable localities in all the warmer parts of the United States, where it receives its name from the negroes of the Southern States. It is an eel-like creature, with very small, three-toed and almost useless limbs, one pair near the head and the other almost at the caudal extremity, which haunts shallow stagnant waters, is numerous in the southern rice-fields, and is superstitiously feared by many persons although perfectly harmless. It feeds on small fishes, snails, crayfish, insects, etc., which it darts upon in the water or roots out of the mud. It reproduces by eggs, deposited at the end of the summer in a damp place, as under a rotting log, which, provided with shells, are connected by a gelatinous cord, and are protected by the female who coils her body about them and afterward takes care of the young. The embryos have well-developed external gills, but these disappear with growth, and even gill-clefts are greatly reduced in adults. Consult: Cope, ‘Batrachia of North America’ (1889); Gadow, ‘Amphibia and Reptiles’ (1901).

Königsberg, kėn'ĭgz-bĕrg, Prussia, a seaport town, capital of the province of East Prussia and of the government of the same name, on the Pregel, about 4½ miles above where it enters the northeast extremity of the Frische Haff. It was once the Prussian capital, and the residence of the electors of Brandenburg, and still is a residence of the sovereigns and the place of coronation. It is surrounded by ramparts and detached forts. The larger part of the town is on the north bank of the Pregel, on hilly ground, a feature being an ornamental sheet of water with richly wooded banks, called the Schloss-Teich (Castle Pond). The older portion is divided into three parts — Altstadt, or Old Town, on the west, Löbenicht on the east, and Kneiphof, on an island of the Pregel. The town, provided with electric street railroads, has on the whole a modern appearance. The principal public buildings are the cathedral, begun in 1333, an interesting Gothic structure, situated in the Kneiphof; a new Gothic church in the Altstadt; the Haberberg Kirche, a conspicuous church in the southern portion of the city; the Schloss, or palace, a large building, containing apartments for the royal family, once the residence of the grand-masters of the Teutonic Order; the Schlosskirche, occupying a wing of the palace, in which Frederick I. in 1701 and William I. in 1861 placed the crown on their own heads as kings of Prussia; the old citadel of Fredericksburg; the handsome exchange, of recent erection; the university, founded in 1554 by the Margrave Albert, and hence called the Albertine, attended by 800 to 900 students, accommodated in handsome new buildings in the Renaissance style, and having connected with it a library of 220,000 volumes, a zoological museum, etc.; an observatory which the labors of Bessel have rendered famous, a botanical garden, a conservatory of music, museums, an ecclesiastical seminary, and other superior schools; town-house, law-courts, post-office, provincial government buildings, a theatre, a lunatic asylum, an infirmary, and several hospitals and benevolent endowments. The town contains other valuable libraries in addition to that of the university. The manufactures include machinery and iron castings, woolen cloth, yarn and thread, leather, sail-cloth, copper, steel, and ironware, chemicals, tobacco and cigars, pasteboard, vinegar, articles made of amber, earthen and stone ware, liqueurs, and artificial mineral waters. There are also breweries and distilleries, and some ship-building. Large vessels bound for Königsberg stop at Pillau, which is considered its port. The principal exports are grain, flax, hemp, oil-cake, bones, timber, etc. Königsberg is the seat of many important provincial courts and public offices. It was founded in 1255. In 1365 it became a member of the Hanse League; was the residence of the grand-master of Teutonic knights from 1457–1528; in 1626 was surrounded with walls; in 1657 it received a strong additional defense in the citadel of Fredericksburg, though the object of the margrave who built it is said not to have been so much to defend the town as to overawe its citizens. It suffered much during the Seven Years' war and from the French in 1807. Pop. (1900) 189,483.

Koo-cha-bee, koo-chä'bē, a food prepared formerly by the Indians from the dried pupæ of certain flies of the family *Ephydridæ,* which form in the water of some of the lakes of northern California and Nevada, and drift ashore in vast numbers in midsummer. They are dried, ground into meal, and baked into edible cakes. A similar food is obtained in Mexico by gathering the eggs of another aquatic fly of the same family, and is called «ahuatle.»

Koo'doo, one of the largest species of antelope (*Strepsiceros kudu*), originally found throughout the entire southern and eastern parts of Africa but now nearly extinct in Cape Colony. The males bear great, rough, twisted horns nearly four feet long, and wound in a wide, open, spiral of about two turns; the females are hornless. Both sexes have short hoofs, a fringe of rough hair along the middle of the back and a similar one on the throat; and are marked with narrow vertical stripes on the flanks, a spinal band, and a chevron on the face, all of white. The kóodoo lives in pairs or small parties in thick forests, especially on the rough hilly districts of Nyasaland. In many districts it has been decimated by the hide-hunters. A smaller species (*S. imberbis*) inhabits the low bushy countries of Somaliland and the Kilima Njaro region.

Kookas, koo'kạz, or **Kukas,** a sect of fanatical Hindus in the Panjab, which originated after the annexation of that territory to British India (1849), in consequence of jealousy of the equal political rights granted to the Mohammedans of that region under British rule. They are a body of reformers of extreme views, and are hence regarded with as much hostility by orthodox Sikhs as they are by the Mohammedans, whose rights they are anxious to invade. The chief right conceded to the Mohammedans by the British government of India, and objected to by the Kookas, is that of killing cows, which are regarded as sacred animals in the Sikh religion; and it was mainly this practice that led to the consolidation of the most violent and fanatical adherents of the Sikh religion into a distinct sect. Their number has been variously estimated at from 50,000 to 800,000. In 1871 they were incited to attack and massacre the

Mohammedan butchers who killed cows in different parts of the Panjab, but they were quickly suppressed by the British government.

Koo'soo, or **Kosin,** a bitter drug prepared from the dried flowers of an Abyssinian plant (*Brayera anthelmintica*), which contains much tannin, and is used as a vermifuge.

Kootenay (koo'tē-nā) **River,** a tributary of the Columbia, rising in British Columbia. It is 400 miles long. After flowing south into Montana and Idaho it again enters British Columbia.

Kopisch, August, ow'goost kō'pĭsh, German poet and painter: b. Breslau 26 May 1799; d. Berlin 3 Feb. 1853. He studied art in the Prague Academy (1815) and in Vienna. From 1819 to 1822 he continued painting, when an injury to his hand disabled him, and he started on travels through Italy, and in Rome and Naples applied himself to the study of local poetry and archæology. It was he who discovered the famous ‘Blue Grotto’ or ‘Grotto of the Nymphs’ on the island of Capri. He returned to Germany in 1828, and received the title of professor in Berlin. He removed to Potsdam in 1847 and occupied himself in writing an account of the royal castles there and in the neighborhood. Most of his pictures are mere sketches. His witty poems, clever stories, and translations, including one of Dante, are all included in his ‘Gesammelte Werke’ (1856).

Kopitar, kō'pē-tär, **Bartholomæus** or **Jernej,** Austrian philologist: b. Carniola, Austrian Hungary, 1780; d. 1844. He was educated at the German gymnasium of Laibach, and completed his studies at Vienna, where he became curator of the imperial library. In 1814 he set out on his travels through Europe, his tour embracing Germany, England, Italy and France, to which last country he went with the special mission of recovering the Slavic manuscripts carried off by the French in 1809. His contribution to philological science consists in pioneer work in Slavic grammar. His principal works are: ‘Grammatik der slawischen Sprache in Krain, Kärnten, und Steiermark’ (1808); ‘Glagolita Clozianus’ (1836); and ‘Hesychii Glossographi Discipulus Russus’ (1839).

Kopp, Georg, gā'ōrg kŏp, German cardinal and statesman: b. Duderstadt 27 July 1837. He was the son of a poor weaver and attended the gymnasium at Hildesheim. In 1856 he became a telegraph operator in the employ of the Hanoverian government. From 1858 to 1861 he studied theology and in 1862 entered the priesthood. He rose rapidly in his profession and in 1872 was made vicar-general at Hildesheim and three years later bishop of Fulda. His reasonable ultramontanism was exercised in bringing about a better understanding between the German government and the papal curia. Being elected member of the house of lords he obtained a mitigation of the harsh provisions which characterized the May laws. In 1887 with the approval of the Prussian government the pope appointed him prince-bishop of Breslau, and in 1893 he was made cardinal.

Kopp, Joseph Eutychius, Swiss antiquarian: b. Beromünster, Canton of Lucerne, 25 April 1793; d. Lucerne 25 Oct. 1866. He studied theology and philology in Lucerne and Freiburg, and in 1819 was appointed professor of Greek in the Lyceum of the former town. While serving in the legislative body of the republic, he was led as a «conservative Catholic» into such bitter controversy with the Jesuits, that in 1845 he was compelled to retire into private life and undertook a tour by way of Vienna to Rome, for the purpose of examining such archives as might throw light upon the history of his native country. He was elected corresponding member of the Academies of Berlin and Vienna. Self taught as he was, he became the Niebuhr of Swiss history, and proved how her true annals had been obscured by such legends as those of William Tell, etc. Among his chief publications are ‘Geschichte der Eidgenössischen Bünde’ (1862); ‘Geschichtsblätter aus des Schweiz’ (1856); ‘Dramatische Gedichte’ (1866).

Köppen, Peter Ivanovitch, pā'tėr ē-vän'ō-vĭch kėp'pĕn, Russian archæologist: b. Kharkov, Russia, 19 Feb. 1793; d. Karabagh, Crimea, 4 June 1864. He was educated at the University of Kharkov and subsequently traveled widely in order to procure historical and archæological material for his work. The outcome of his investigations, written in German, is comprised in the reports of the Academy of St. Petersburg, but among other works of his are: ‘Kulturgeschichte Russlands’ (1825) and his famous ‘Ethnographical Map of European Russia’ (1851).

Koran, kō'ra̤n or kō-rän' (Ar. *quran, qoran,* reading, from *qara,* read; with the Arabic article, *Alkoran;* also called *Furkan.* salvation, *Al-Mushaf,* the volume, *Al-Kitab,* the book, *Al-Dhikr,* the reminder or the admonition), the sacred scripture of the Mohammedans, written in Arabic and professing to be the revelation of Allah (God) to Mohammed. It contains a code for the government of all Moslem transactions, and is accepted by true Mussulmans as uncreated and eternal. According to orthodox Mohammedan belief it was written from the beginning in golden rays on a magnificent tablet in heaven, and was communicated to Mohammed on the night of Al-Kadr, in the sacred month of Ramadan, by the angel Gabriel, chapter and verse as they stand, on parchment made of the skin of the ram which Abraham sacrificed instead of his son Isaac, in a volume ornamented with precious stones, gold, and silver from paradise. Other traditions are different, one being that Mohammed was assisted in composing it by a Persian Jew and a Nestorian monk. Its revelations cover Mohammed's entire prophetic career, 610–632 A.D. It is the first work known in Arabian prose, its scattered discourses being preserved on stones, palm-leaf ribs, leather, etc. Except in a few instances, Allah is the speaker. Mohammed named the book at the time of imparting the first revelations, and the name was retained for the collection when this was made in 633 by Zaid, son of Thabit, under direction of Abu-Bekr, father-in-law of the prophet. The authorized text, ever since accepted, was produced under the caliph Othman, 650 A.D., from the fragments, originally thrown together without order, and afterward gathered in a volume with no attempt at arrangement, not long after Mohammed's death. In order to free the book from various readings, Othman commanded the destruction of all other copies, and in purity of text the Koran stands alone among religious scriptures. The chronological order has never been clearly determined, and many conjectural rearrangements and subdivisions have been made by Mohammedan and other scholars.

In size the Koran is nearly the same as the New Testament; it is divided into 114 suras or chapters, each beginning: «In the name of God»; the suras have various subdivisions. The Koran is dogmatic throughout; from beginning to end it is dominated by the positive keynote: «There is no doubt in this book.» Its author was indebted to many other writers. Of the sacred writings of the Jews he directly cites only the Pentateuch and the Psalms; of the New Testament, with which internal evidence shows him to have been acquainted, he cites nothing; but besides the religious writings of the Jews and Christians he knew the systems of the Magians, the Sabians, and other sects, from whom he derived many materials to be incorporated in a new religion for his own country, where numerous and diverse faiths already existed.

Mohammed lived much in solitude, meditating on his mission and his doctrine; he did not reject the teaching of any sect; asserted his desire to restore the purity of the true faith; announced as his fundamental doctrine the unity of God. This idea, together with conceptions of divine might, sovereignty, compassion, and other attributes of Godhead, is all-pervading in the pages of the Koran; «God is God,» it declares, «and Mohammed is his prophet.» He felt that the unity of God had been the essential doctrine of all true religion, in which custom and ceremony were but accidents. «We make no difference,» he says, «between that which God has taught us and that which Abraham, Isaac, Ishmael, the twelve tribes, Moses, and Jesus have learned from the Lord.» «God commands thee to receive the religion which he prescribed to Noah, which he has revealed unto thee, and which he imparted to Abraham, Moses, and Jesus.» To Jesus Mohammed assigns a place in the seventh or highest heaven, in the immediate presence of God.

The Koran dwells much on the resurrection and the last judgment, setting these forth somewhat after the manner of the Apostle Paul: «When the trumpet sounds the second time, they shall rise quickly from the graves to appear before God.» «A sound of the trumpet of judgment will assemble all men before my throne, and every one shall there receive the reward of his deeds.» In its presentation of the last judgment the Koran resembles the teachings of the Jews and the Magians; in the passage of the narrow bridge to paradise — Al-Sirat, over the abyss of hell, finer than a hair, sharper than a razor; in the book wherein all the actions of men are set down, and the scale in which they are weighed. Quite Jewish and Magian also are the Mohammedan views of paradise. The doctrine of predestination as contained in the Koran was successfully employed by Mohammed to encourage his followers in the face of every trial and danger. Herein he probably availed himself of beliefs already widely held, especially among the Sabians, with their worship of intelligences supposed to reside in the heavenly bodies, controlling the lives of men and the course of events, and by the Magians, who held a system of dualism, the influence of these beliefs having exerted itself upon the Arabians.

In the matter of religious exercises Mohammed largely adopted such as he found, to those which were narrow or vague, giving more of universality and precision. The Koran prescribes prayer, fasting, alms, and the pilgrimage to Mecca; prayer embraces ablutions, purifications, and all other exercises needful to preparation for it; to those who sought to be relieved from these observances Mohammed replied, «Religion without prayer is nothing»; prayer he calls «the key to paradise.» Surpassing the severity of the rabbis, he prescribed prayer five times a day, with the face of the suppliant turned toward Mecca. To give alms was always an Arabian practice, but the Koran makes it obligatory. Concerning polygamy, divorce, inheritance, etc., it follows the law of Moses and the decisions of the rabbis, adapting them to the prejudices and customs of the prophet's people; it forbids few of the old practices save idolatry; "God," it says, «intended that his religion should be easy, else, as he well knew, you would only become hypocrites.»

Although the Koran is written in prose, the different parts of a sentence end in rhymes, and there is marked diversity of style, yet withal an impressive unity, characterized by a free and forcible eloquence unequaled in any other Arabic writings. The earlier utterances of the prophet seem often to be outbursts of unbridled imagination, though still the solemn words of prophetic earnestness proclaiming God with power to reach and sway the hearts of men. In later portions of the book the tone takes more of calmness; imagination is subdued; the author dictates extended passages to be taken down by his hearers. The highest elevations are where he speaks of the greatness of God and describes the last judgment, the pleasures of paradise, and the pains of hell.

The moral precepts of the Koran exhibit a lofty feeling of humanity and a profound sense of ethical law reduced to most practical forms. They inculcate all the noblest virtues and pieties — obedience to divine commandments, charity, humility, mildness, temperance, toleration, and the strong virtues of courage, faith, and justice. To death in the cause of religion it ascribes a peculiar merit. The influence of this book through many centuries and among many peoples has been vast, and it still controls the lives of a great portion of the human race. «From the Atlantic to the Ganges,» says Gibbon, «the Koran is acknowledged as the fundamental code, not only of theology, but of civil and criminal jurisprudence; and the laws which regulate the actions and the property of mankind are guarded by the infallible and immutable sanction of the will of God.» The divinity and authority of the Koran have at times been assailed among Mohammedans themselves. The first serious heresy, about 740, was suppressed by the execution of its chief author, but appeared again in the next century, and was not finally crushed out until 842, when Harun II. prohibited all discussion regarding the character of the Koran, which has since been everywhere held by Mohammedans in admiration as the great Arabian classic, and in reverence as the book of religious authority. Once each day it is read through in the mosques of the Sultan and in the adjoining chapels. By the faithful it is never carried below the girdle; not without their own purification may they even touch it; and on walls, doors, banners, etc., its texts are frequently written.

Commentaries on the Koran are almost innumerable. The library of Tripoli, in Syria, is said to have contained no less than 20,000 of them. Many editions have been published in different countries. For English readers that of Sale (1734), with its comprehensive introduction, covering all the important aspects of Mohammedanism, is still of prime value. The translation of E. H. Palmer (1880) is authoritative, as is also that of Rodwell (2d ed. 1876). Several versions in German have appeared in which it was attempted to reproduce the rhyming style of the original: J. von Hammer's (1811), A. Sprenger's (1861–5), Fr. Rückert's (1888), and M. Klaproth's (1890). Other editions which have their special values are Hinkelmann's (1694), Maracci's (1698), and Flügel's (1883). Consult: Sprenger, ‹Leben und Lehre des Mohammed›; Kremer, ‹Herrschende Ideen d. Islam›; Braun, ‹Gemälde d. Islam›; Deutsch, ‹Islam›; Dozy, ‹L'Histoire d'Islamisme›; Muir, ‹Life of Mahomet and History of Islam›; Gibbon, ‹Decline and Fall,› ch. L.; Irving, ‹Mahomet and his Successors›; Carlyle, ‹Heroes,› «The Hero as Prophet»; Lane, ‹Selections from the Koran›; Johnson, ‹Oriental Religions: Persia,› sec. «Islam»; Conway, ‹The Sacred Anthology› (for many good extracts from the Koran); Hirschfeld, ‹New Researches into the Composition and Exegesis of the Koran (Eng. trans., 1902). See ISLAM; MOHAMMED; MOHAMMEDANISM.

Ko'ras. See HOTTENTOTS.

Kordofan, kŏr-dō-făn', a province of Egyptian Sudan in lat. 12° 30′ and 15° 30′ N.; lon. 29° 20′ and 31° 30′ E.; between the White Nile and Darfur. The surface is generally flat and the soil naturally fertile. The principal articles of export are gum, hides, and senna leaves, all monopolized by the government as most lucrative; ivory, cattle, tamarinds, ostrich eggs and feathers, gold, salt, slaves, etc.; the imports spices, sugar, coffee, sulphur, rice, soap, cotton and linen cloth, etc. From 1821 onward Kordofan was subject to the Viceroy of Egypt, the country having been subdued by Mehemet Ali. In 1883 it took part in the successful Mahdist revolt, but was regained for Great Britain and Egypt in 1898. Pop. about 300,000, chiefly Arabs.

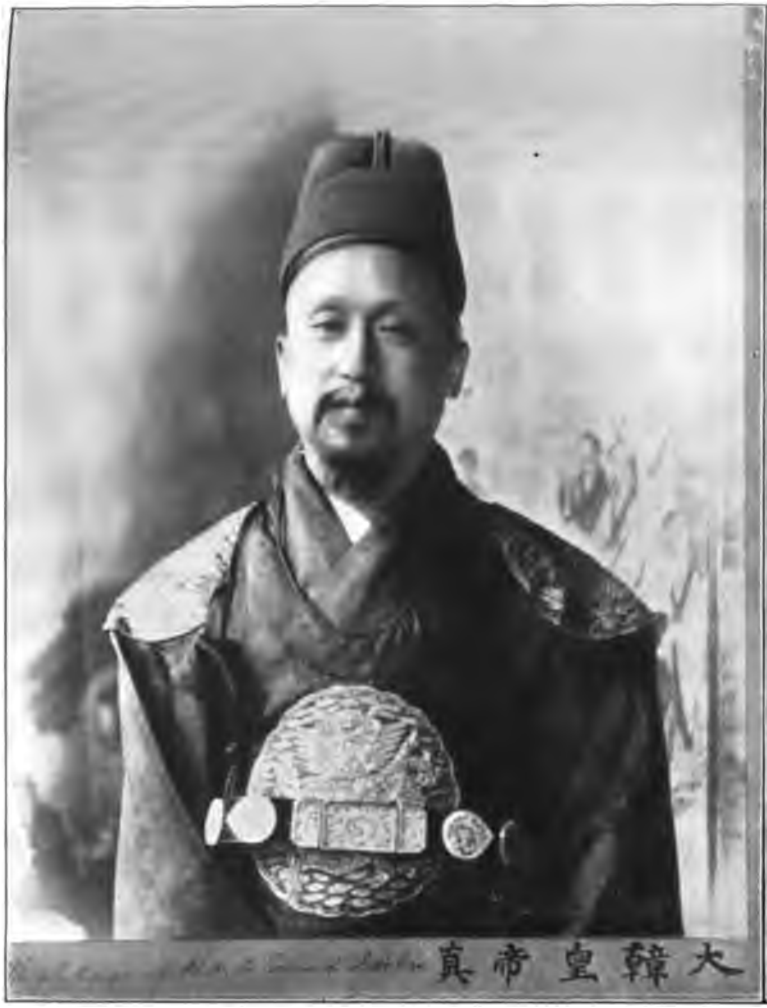
Korea, or **Corea** (from the native pronunciation of Chinese Kao-li — see *History;* Li Tan in 1392 revived the old name Cho-sen or Cho-sŏn, Chinese «morning freshness» or «dawnland» — that is, «the east»; in 1897 the official name was made Dai Han). An Asiatic kingdom northeast of China, comprising a strip of coast and a peninsula projecting southward from Manchuria, divided from it by the great valleys of the Yalu or Amnok southwest and the Tuman northeast, both rising in the colossal peak of Paik-tu (White Head), 8,300 feet high. The Japan Sea divides it from Japan, whose southernmost island (Kiushiu) approaches its southern tip within 100 miles, separated by Korea Strait with large islands midway; to the west, Korea Bay and the Yellow Sea, marked off by Shantung peninsula, divide it from China. A dense archipelago fringes it south and west. Its parallels are from 34° 17′ to 43° N., or about the same as from Concord, N. H., to Wilmington, N. C., and average much south of Italy; its meridians, 124° 38′ to 130° 30′ E. It is about 600 miles long by 135 broad; area 80,000 to 90,000 square miles. Population probably 15,000,000 to 20,000,000.

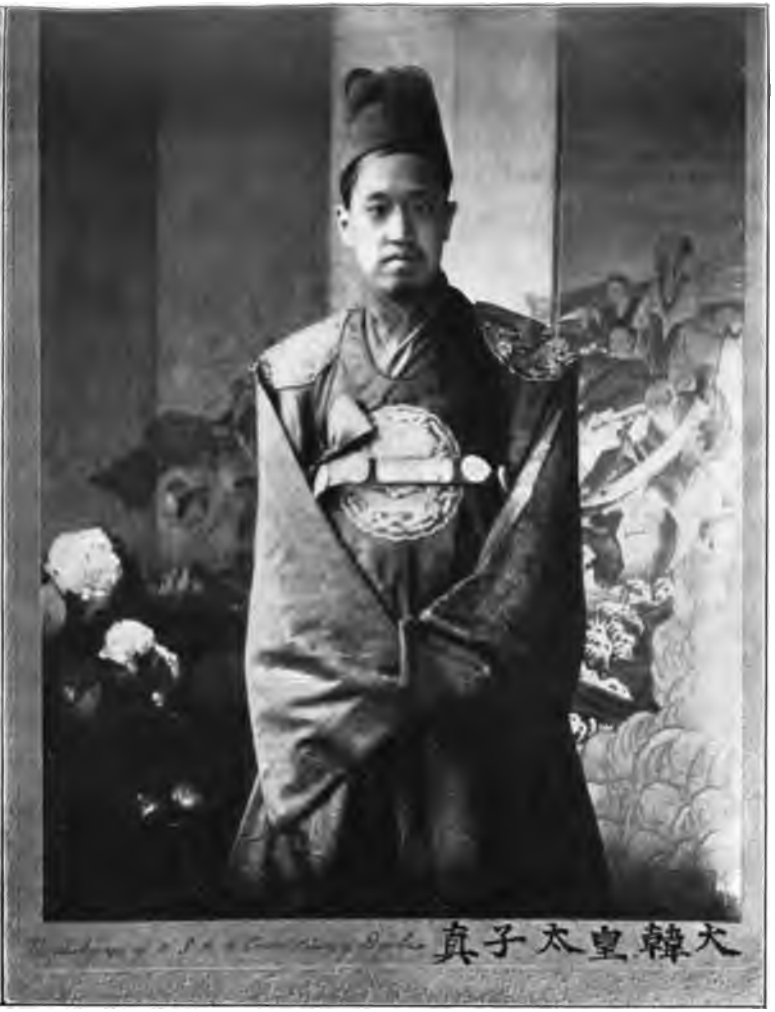
Korea is traversed north to south by a mountain backbone of striking individuality: a perpetual zigzag, skirting the eastern shore with slender coast-lands, in a steep solid wall unbroken for hundreds of miles save by Yung-hing or Broughton's Bay at the northern neck. In the north it has summits 4,000 to 8,000 feet high, and at Cape Pelissier, about lat. 37°, culminates in Mt. Popoff (4,800 feet); thence the main chain turns southwest, and ends in the extinct volcano of Mt. Auckland (6,700 feet), on Quelpaert Island, while to the east it throws out low hills and plateaus. The islands of the southern archipelago, verdant rocks worn into the semblance of fantastic castellated ruins, are the ends of its spurs. On the eastern side the ridge is timbered to the summit; on the west almost treeless, and seamed with deep ravines shallowing out into broad fertile plains, occupying most of Korea. On the east below the boundary there is but one river of any size, the Nak-tong along the southeastern uplands, and almost no islands; the west has 10 considerable streams, and the coast is thickly notched with harbors and fringed with fertile islets.

The chief rivers are, from the north: The great Yalu or Amnok, a mile wide and rising 40 feet in flood, navigable 30 miles for seagoing junks, and 175 for boats, to Wi-wŏn. Opposite it the Tuman. The Tai-dong or Ta-tong, navigable for boats 75 miles to Ping-yang. The Han («*the* river»), rising on the western slopes of the eastern ridge but 30 miles from the Japan Sea, draining nearly the whole breadth of the peninsula with two main arms, and flowing into a bay of the Yellow Sea among islands. About 30 miles up lies Seoul, the capital, and a line of small steamers runs between it and Chemulpo, on Imperatrice Gulf as much farther south; boats ascend nearly 100 miles more. The Nak-tong (above) empties into Korea Strait near Fusan, and is navigable 140 miles for vessels drawing 4½ feet. The best harbors are Gen-san and Port Lazareff, on Broughton's Bay; the best on the south coast is Fusan on Korea Strait. The tides on the west and south are very high and rapid, often leaving vessels stranded on mud banks.

The climate is much like that of the eastern coast of America in the same latitudes; the north and centre have very hot summers and severe winters; the south is like the Carolinas, and tempered by the ocean breezes. The Han is frozen in winter so that at Seoul, where it is 400 yards wide, is is available for cart traffic three months of the year, from December to February. The rainfall averages 36 inches, 22 in the crop season. A fall of only 4.1 inches in 1901 created a famine.

Flora and Fauna.— There is a great variety of excellent hardwood timber on the east slopes and the northern mountains; in the west it is scarce and sparingly used; lack of coal has caused much wasteful denudation in other parts. The one surpassing animal of the native fauna is the man-eating tiger, who fills the native proverbs and literature, depopulates whole vil-

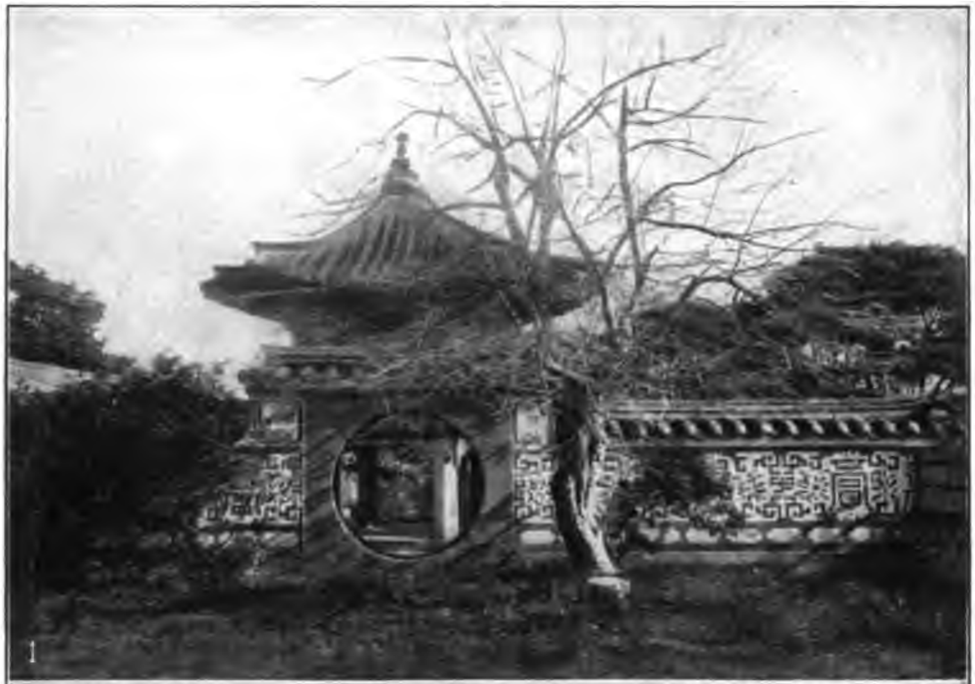


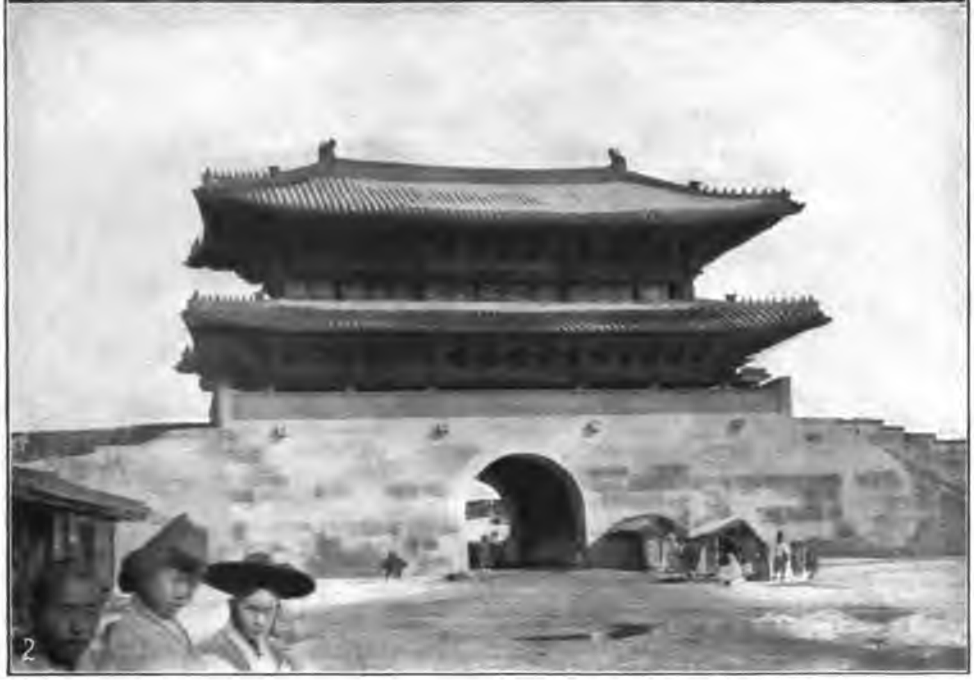


By Courtesy of J. Sloat Fassett.

THE EMPEROR OF KOREA. THE CROWN PRINCE OF KOREA.
From late photographs presented to Mr. Fassett by the Emperor.

KOREA.





1. Round Gate, on the Palace Grounds, Seoul. 2. Big East Gate, Seoul.

lages, and even besieges houses for days, sometimes leaping on the thatched roof and tearing his way down through. Besides him there are leopards, tiger-cats, and foxes; deer, beaver, badgers, otters, martens, etc., and a great variety of birds.

Products.— The great native crop is ginseng, which grows wild in the Kange Mountains, and is extensively cultivated about Kai-seng; it is a government monopoly, and despite much smuggling, yields some $500,000 a year, or a ninth of the state revenue. Among other products are rice, wheat, millet, sesame, Indian corn, beans, cotton, hemp, and perilla (for oil and pigment). The domestic animals are few. The cattle are excellent, the bull being the usual beast of burden; the ponies very small but hardy, fowls good, pigs inferior. Iron ores of excellent quality are mined; and there are copper mines in several places. In 1886 the value of gold exported was $503,296; the silver output is very small. Three fourths of the trade is with Japan, and over four fifths of the remainder with China.

Government.— This is a hereditary absolute monarchy: till 1895 tributary to and receiving investiture from China, and like it in administrative forms, with officials appointed by examination in the classics. On the declaration of independence (see *History*), the entire system was abolished, as well as the privileges of the aristocracy, and a cabinet of 10 ministers in charge of different departments formed, who with five councillors form a grand council of state to lay measures before the emperor. Till 1896 the country was divided into eight *do* or provinces; it was then redivided into 13, including a metropolitan province around the capital. These are divided into 339 *kun* or prefectures, 7 under *pu-yan* or city governors; 4 treaty ports are under *kamni* («trade overseers»), ranking with consuls. The revenue is about $4,500,000 a year. The standard is gold, and a native coinage is made, supplemented by Japanese paper and coin. The weights and measures are the same as the Chinese. There is an army of 17,000 men with foreign training and equipments, and a bodyguard of 1,000, but no navy.

Social Conditions and Education.— The usual dwellings are mud hovels thatched with straw, and the conditions of life for the masses, as in China, are hard and squalid; but actual distress is rare and beggars are few. Caste till recently was iron-bound, and no offices of even local importance could be held by other than nobles, who are distinguished by colored clothing and horsehair hats. Women are secluded; concubinage is allowed, but only one legal wife at a time. The immemorial system of education was almost wholly in Chinese, which contained the only written memorials needing it, and was of Chinese classics. But in 1894–5 a department of education was established, and a thoroughly graded public-school system, including normal training. There are also schools of foreign languages taught by speakers of the languages.

Religion.— See *History* for the vicissitudes of Christianity. There are now about 30,000 Roman Catholic and 2,500 Protestant natives. The popular religion is the degraded Shamanism (q.v.); the higher classes are Confucians; the anciently all-powerful Buddhism, crushed by the revolution of 1392, is slight and uninfluential, with a few ignorant monks.

Population.— The people are a mixed race of disputed elements, apparently Mongoloid and Aino with Manchu and Malayan infusions. As in all Eastern countries, where a census means a tax and conscription list (see CENSUS, par. 1), no accurate statistics can be had. An official census of adult males liable to tax in 1900 was 5,608,351; which must mean toward 20,000,000 total population, enormous as the figure is for an agricultural people on this size of territory. Foreign population 21,783, including 16,142 Japanese and about 5,000 Chinese.

The chief cities are Seoul (Han-yang), the capital, estimated at over 200,000; Ping-yang, perhaps 40,000; and Kai-seng. A trolley line nine miles long, built 1899, is operated in Seoul by Americans.

History.— The traditional founder of Korean nationality is the Chinese noble Ki-tse, who left China with 5,000 followers 1122 B.C., and established a kingdom with capital at Ping-yang. The first authentic history is the annexation to China 108 B.C. A century or so later it split into three princedoms, of which, about 960, Koryu (Kao-li) came to the front, probably from borrowing the higher Chinese civilization. It recast the administration upon the Chinese model, introduced Chinese methods and arts, and initiated several centuries of brilliant progress and prosperity, enriched by art and literature. Buddhism was the paramount religion, and developed a powerful and rigid ecclesiastical hierarchy. As a result, a Protestant movement took place, and in 1392 a revolution headed by Li Tan founded the present dynasty and expelled the priests. The capital (*seoul*) was fixed at Han-yang. When the Manchu power began to rise in the 15th century, China, to protect herself against its ravages, desolated a strip of fertile territory many thousand square miles in extent, then or early in the 17th century destroying four cities and many villages and removing 300,000 inhabitants; and down to 1875 this zone of 60 miles wide by 300 long was kept as a permanent buffer between China and Korea. During the rise of the Japanese shogunate out of the 16th century anarchy, Hideyoshi, as a preliminary to invading China, sent an army into Korea, rapidly overrunning it. But Korea is like Spain, easy to conquer and impossible to hold; and the stolid resistance of the natives, with the Chinese armies, gradually forced the Japanese out of the peninsula six years later, retaining Fusan on the southeast coast as a trading station. Thirty years later the Manchus, previous to their conquest of China, invaded it and exacted a tribute, which was continued to the Manchu dynasty in China; in 1653 it was reduced to a third, and for generations down to 1894, when it was finally abolished, had been only nominal, as an acknowledgment of Chinese supremacy and a trading license. But the Chinese wisely attempted no permanent occupation.

Korea had always as intense a determination to seclude herself from foreign influences as ancient Egypt, and practically the first knowledge obtained of it by modern Europe was through the shipwreck of some Dutch on the coast in 1653, though the Jesuit missionary Cespedes had entered it in 1594. In 1784 new missionaries came and planted Christianity in the peninsula, despite steady persecution; in 1835 the French missionaries reinforced them. But in 1864 came a fiercer blast. The then king died childless, and his oldest widow set aside the natural successor, her nephew, and nominated Yi-Hevi, the present king — the 12-year-old son of a royal prince, Ni-Kung, whom she made regent. The latter was a savage reactionist, and let loose fire and blood to extirpate the foreigners, rigidly excluding all new ones. A futile French expedition was sent against him in 1866; the same year a stranded American schooner, the General Sherman, was burnt and her crew murdered in sight of Ping-yang. An American expedition sent in 1871 had no success. Meantime several nations were attempting to force Korea into treaties of commerce and gain trading privileges, but Japan was the first to succeed, having the ports Gensan and Fusan opened in 1876, and Chemulpo in 1880. Meantime the «neutral strip,» for many years a nest of brigands and pirates, was abolished by Li Hung Chang in 1875. In 1882 Commodore Shufeldt negotiated a treaty of friendship between the United States and Korea, and thence on, other nations were rapidly admitted — Great Britain and Germany in 1883, Italy and Russia in 1884, France in 1886, Austria in 1892, and China in 1897.

The flood of new ideas and habits aggravated the conflict between the progressives and the reactionaries, in which the former won, and Korean embassies began to visit other countries,— Japan in 1880, the United States in 1883. The nativists raised an insurrection in 1884. The greatest breach with the past, however, was the result of the Chinese-Japanese war of 1894-5, one of the pretexts of which was the action of China in assuming the ancient suzerainty over Korea. It was at Ping-yang that the first heavy defeat was inflicted on the Chinese, and off the Yalu River that the Chinese fleet was destroyed. On 8 Jan. 1895 the king of Korea proclaimed its independence, and the Chinese Gate at Seoul was publicly destroyed with impressive ceremonies. The Treaty of Shimonoseki was then made with Japan; and Korea has become a «sphere of influence» for the Japanese, who will not let it mold in antiquarian ideas. The present conflict, however, is not between Japan and China in the control of Korea, but between Japan and Russia, the latter needing southern ports for her Pacific empire, the former thinking that Russian control of her neighbor means the permanent crippling of her naval development — in which the history of England might reassure her. In 1897 the king proclaimed the country an empire, named it Dai Han, and took the title of emperor.

Language.— Korea since early times has employed two languages: Chinese for writings and native Korean for speech, Chinese if spoken being an acquirement like French in America. The literature in Chinese is sometimes translated into Korean, however; and the recent Korean declaration of independence has produced a revival of appreciation for the native tongue, as with so many other nations from like causes. The reforms of 1897 were proclaimed in the vernacular.

Korean is of a not extreme agglutinative type, belonging to the polysyllabic branch of the Mongol-Tartar languages like Japanese, and unlike the monosyllabic Chinese; it is structurally unrelated to the latter, though it has very many Chinese loan-words, pronounced after its own phonology. Its resemblances to Japanese are far closer: mutual translations word for word, and even particle for particle, are quite feasible. The particles and grammatical terminations in both represent punctuation, emphasis, and inflection of nouns and verbs. The honorific vocabulary — almost a complete ceremonial language even in construction, to express relations between superiors and inferiors, and equals — is common to both. The differences are mainly euphonic: Korean vowels are heavily assimilated to those which follow, the syllables need not end with a vowel, and the spelling is as irregular as English, none of which is true of Japanese.

The grammar of Korean is extremely flexible and pregnant; like Chinese, the roots are invariable. There are no inflectional forms for number, person, or case, or conjugation of verbs, and no form for gender; all are indicated by particles without meaning, or whose meaning has been lost, affixed to the stem, and varying with its terminal letter, as consonant, vowel, or liquid. There are no pronouns of the first and second person; the third, with relational particles, serving for both. Development has expended itself on the verbs, which are marvels of varied, flexile, and ingenious expressiveness. Many words not primarily verbs can be turned into them (as in English), and these with the true verbs constitute 20 per cent of the entire vocabulary. The grammatical forms of the verb are said to average 300. Adjectives and adverbs are not distinguished from the verbs, and the prepositions are verb forms. All conditions expressed by inflections in Western languages — present, continuing, past, unfinished or completed, optative, subjunctive, potential, interrogative, participial, etc.— exist in Korean, and a vast number of others expressed by us in long sentences. Some verbs have no passive, but all have a negative voice. There is no number; the three persons in every variant are expressed by courtesy forms — one to or of superiors, one for equals, one for inferiors or of things. The syntax is positional, as with Chinese. The object precedes the verb or other governing word, the prepositions are postpositions, the adjective precedes the noun it qualifies and the adverb its verb or adjective (as in English). A dependent clause precedes its principal.

Korean has an alphabet of 25 letters, 14 consonants, and 11 vowels; a very simple and scientific one, analyzed by organs of speech. The vowels are a, ya, ŭ, yŭ, ọ, yo, u, yu, i, eu, ă; with the diphthongs è, é, e'. The consonants are — labials, p, ph, m; dentals, t, th, n, l; palatals, ch, chh, s; gutturals, k, kh; laryngeals (?) h, ng final. There are no letters f, v, w, b, d, g, j, or z, though (except the first, which is replaced by p) they exist in speech. There is but one character for l and r, and neither of them can begin a word, their place being taken by n. The characters — women and children's only, the true «learned» characters being Chinese — are of an extreme simplicity, contrasting strongly with the complex Chinese; and there is a cursive form. This alphabet is called ***onmun***, «the vulgar»; and there is a system called ***nido,*** in which the letters are grouped in the 199 possible combinations and learned by rote. The writing is in syllables, in columns from right to left, as with Chinese.

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Ko'ren, John, American statistician: b. Decorah, Iowa, 3 March 1861. He was graduated from Luther College in his native town and from Concordia Theological Seminary, St. Louis, and has since been prominent in investigations of the liquor problem, in State and municipal employ. He has published: 'Economic Aspect of the Liquor Problem'; 'The Liquor Problem in its Legislative Aspects' with F. Wines (1897–8).

Körner, Karl Theodor, kärl tā'ō-dōr kėr'-nĕr, German poet: b. Dresden 23 Sept. 1791; d. 26 Aug. 1813. After studies at Freiberg, Leipsic, and Berlin, young Körner, through Kotzebue's influence, was appointed dramatist to a Vienna theatre, and wrote light comedies, such as 'The Green Mask' and 'The Night Watches,' and some tragedies, of which 'Zriny' was the most successful. In the uprising of the German nation against Napoleon, Körner not only displayed heroic personal courage in many encounters, but wrote numerous patriotic songs. These were published in 1814 under the title of 'Lyre and Sword.' The most famous of these pieces is the 'Sword Song,' composed only a few hours before the author fell in a skirmish, between Schwerin and Gadebusch.

Kosciuszko, kŏs-ĭ-ŭs'kō, Pol. kŏs-choosh'-kō, **Thaddeus** (Polish TADEUSZ), Polish patriot: b. Mereczowszczyzna, Lithuania, 12 Feb. 1746; d. Soleure (Solothurn), Switzerland, 15 Oct. 1817. He was educated in the military school at Warsaw, and completed his studies in France. On his return to Poland he became suitor to the daughter of Sosnovski, marshal of Lithuania, but his love meeting no return he betook himself to America (1777). Having attracted the notice of Washington, he was appointed him engineer, with the rank of colonel, and afterward general of brigade. He performed excellent service and at the end of the war received the thanks of Congress, with the brevet of major-general. He returned to Poland in 1786, and on the occasion of the reorganization of the Polish army in 1789 was appointed major-general, and having declared for the constitution of 3 May 1791, he fought in the war which soon after broke out, with the rank of lieutenant-general. When Stanislaus Augustus in 1793 agreed to the second partition of Poland, Kosciuszko withdrew from the army and retired to Leipsic. At this time the legislative assembly in France conferred on him the title of French citizen. When a new insurrection broke out in Poland for the purpose of delivering the country from the Russians in 1794 Kosciuszko was recalled and made commander-in-chief of the insurgent army. He defeated the Russians at Raclavice, but at the battle of Maciejovice his army was defeated, and he himself wounded and taken prisoner. He remained in captivity for two years, and he then proceeded to England, and thence to America. In 1798 he returned to Europe on a mission from Congress to France, and contributed to bring about an understanding between the latter country and the United States. In April 1814, he addressed a petition to Alexander I., emperor of Russia, requesting him to grant an amnesty to all expatriated Poles, to accept the title of King of Poland, and to give that country a free constitution similar to that of England, but the petition remained without effect. In April 1817 he issued a letter of emancipation to the serfs on his estate of Siechnovice, in Poland. His death was occasioned by a fall from his horse. In 1818 his body was removed at the expense of the Emperor Alexander of Russia to Cracow, where it was buried in the cathedral, and a monument erected to him.

Consult: Lives by Falkenstein (1834), German; Chodzko (1837), French; Paszkovski (1837), Polish.

Kosciuszko, Mount, in Australia, one of the highest mountain peaks in the Muniong Alps, in New South Wales, near the frontier of Victoria. It is 7,308 feet high.

Kos'mos. See COSMOS.

Kossuth, kŏs-sooth', Hung. kŏsh'oot, **Lajos** (LOUIS), Hungarian patriot: b. Monok, Hungary, 27 April 1802; d. Turin, Italy, 20 March 1894. He came of a family of noble rank and of the Protestant religion, studied and practised law, and in 1832 entered the parliament of Pesth, becoming also editor of a newspaper circulated in writing. For persisting in publishing the parliamentary debates he was condemned to four years' imprisonment, but was released in 1840 before the end of this period. In 1841 he became editor of the Pesth 'Journal,' a paper that advocated very advanced views; and in 1844 founded the national league in opposition to the Viennese government. In 1847 he was elected to the Hungarian diet by the national party, and in 1848 became minister of finance in the Hungarian government. His influence had much to do in bringing about the revolution which followed, and in which he played the most prominent part, being appointed governor or dictator by his fellow-countrymen; but the intervention of Russia rendered all the efforts of the Magyars unavailing. He resigned his position in favor of Görgei (whom he accused of treachery), and in 1849 he found it necessary to take refuge in Turkey, where he was kept as a prisoner. Being released in 1851 through the influence of Great Britain and the United States, he soon after visited both these countries and was received in the most enthusiastic manner. He endeavored subsequently to induce Napoleon III. as well as Victor Emmanuel to act against Austria in favor of Hungarian independence, but without success. Though by the amnesty of 1867 he might have returned to his native land he did not do so, but lived chiefly in Italy, and was never fully reconciled to the union that had taken place between Austria and Hungary. His ‹Memories of My Exile› appeared in English in 1880.

Ko'to, a Japanese musical instrument, having a long box, larger at one end than the other, and with a convex top over which 13 silk strings are strung and fastened tightly at each end, each string having a bridge. To tune the instrument it is necessary to move the bridges. The instrument is played with both hands like a harp.

Kotow, kō tow' or -tō', a Chinese form of obeisance; the ceremony of prostration, in which an inferior, kneeling, touches his forehead to the ground. Kotowing is unknown outside of China.

Kotzebue, August Friedrich Ferdinand von, ow'goost frĕd'rĭH fĕr'dĭ-nänd fōn kŏt'sĕ-boo, German dramatist and Russian official: b. Weimar 3 May 1761; d. Mannheim 23 March 1819. In 1781 he went to St. Petersburg, where, obtaining the patronage of the empress, he was made governor of Esthonia and ennobled. About 1800 he returned to Germany, and attacked Goethe and other great German authors who had refused to associate with him. In 1806 he went again to Russia, and lived from 1807 on his estate Schwartze, in Esthonia. In 1813, as counsellor of state, he followed the Russian headquarters, constantly writing to excite the nations against Napoleon. In 1817 he received a salary of 15,000 roubles, with directions to reside in Germany, and to report upon literature and public opinion. Kotzebue, who during the whole campaign had written in favor of the Russians, even at the expense of his native country, and had expressed the utmost contempt for liberal principles and institutions, was now odious in the eyes of most of his countrymen, and regarded as a spy. This feeling was so strong in the case of a young enthusiast named Sand, that he assassinated him as a traitor to liberty. Kotzebue wrote more than 100 plays, a history of Germany and other works, most of which are now forgotten. Two of his plays, ‹The Stranger› and ‹Pizarro,› are still performed on the English stage.

Kotzebue, Otto von, Russian navigator; second son of A. F. F. Kotzebue (q.v.): b. Reval 30 Dec. 1787; d. there 15 Feb. 1846. In his 17th year he accompanied Krusenstern in his voyage round the world. In 1815 he was appointed to the command of the ship Rurik, destined to ascertain the practicability of a northeast passage in the direction of Bering Strait. He discovered several groups of islands in the Pacific, and a large sound on the southeast of Bering Strait, which now bears his name; and returned after a three years' absence. The results of the voyage were published in a work called ‹A Voyage of Discovery in the South Sea and to Behring's Strait in Search of a Northeast Passage› (1821–23). In 1823 he was commissioned by the Emperor Alexander to make a third voyage round the world. He returned in 1826, publishing the results of the voyage in a work which has been of great importance to hydrography, particularly that of the Pacific, ‹Neue Reise um die Welt› (1830).

Kou'miss. See KUMISS.

Kuropatkin, Alexei Nikolayevitch, Russian soldier: b. 17 March 1848. He was trained for the army in the Imperial Military College and the Academy of the General Staff; was sent abroad to study military conditions in various European countries; in 1874 became a member of the general staff of the army; in 1876–7 assisted Skobeleff in the conquest of Khokand, Turkestan, and its reorganization as the territory of Ferghana; and in 1877–8 won high distinction in the Russo-Turkish war by his services at Plevna and the Chipka Pass. In 1878 he was made colonel and in 1878–9 was chief of the Asiatic bureau of the general staff. In 1880–1 he was in Middle Asia, where he commanded the main detachment against the Tekke-Turkomans, and, after a forced march of 600 miles across the desert, stormed Geok-Tepa, by which victory he won his greatest reputation. He was made major-general in 1882, lieutenant-general in 1890, governor of the Trans-Kaspian district and commander of the troops in that district in 1890, and minister of war in 1898. In 1901 he became general of infantry. At the outbreak of the hostilities with Japan, he was sent to command the Russian forces in the Far East. As a military writer he is favorably known by several volumes, including ‹Kashgarie› (1879), for which he received the gold medal of the Imperial Russian Geographical Society; ‹The Operations of the Troops of General Skobeleff during the War of Russia with the Turks› (1885); etc.

Kowloon', or **Kaulun,** a district in China, forming a peninsula at the mouth of the Canton River.

Koyunjik, koo-yoon-jĕk', or **Kuyunjik.** See NINEVEH.

Kraft, kräft, **Adam,** German sculptor: b. Nuremberg 1440; d. Schwabach, Bavaria, 1507. Nothing is known of his teachers, his student travels or his fortunes. His known productions begin with the seven reliefs (Stations of the Cross) set up in Nuremberg 1490 near the entrance of Saint John's Church; these are now in the German Museum, their original place being taken by sandstone copies. He executed many sepulchral monuments, and in the Church of Saint Sebaldus is the statue he made for Sebald Schreyer, 1492. In the choir of the same church is his bas-relief of three scenes from the Passion, the figures being life-size. He also carved the monument for the Pergerstorff family in the Frauenkirche (Church of St. Mary, the Virgin); that for the Landauer family in a chapel of the Church of St. Ægidius. His last work was the Entombment, a group of 15 life-size figures in the mortuary chapel of the Holzschuherschen family, a part of the Church of St. John (1507). He also executed several works of minor importance, as decorations of private and public buildings. His masterpiece is the tabernacle in the Church of Saint Lawrence which he took seven years (1493–1500) in completing. It is more than 50 feet high, and is an example of gorgeous Gothic carving enriched with numerous figures. At the foot he has placed his own portrait, life-size. His style is bold and vigorous, his conceptions are profoundly religious, and his power of life-like characterization is wonderful. He is the finest exponent of the Nuremberg school of Gothic sculpture.

Krait, one of the most dreaded of Oriental poisonous snakes (*Bungarus cæruleus*), nearly related to the cobras. It inhabits nearly all India and Ceylon, is very common in Bengal and southern India, and causes more deaths than any other snake, since in its pursuit of rats, lizards and snakes, it frequently enters camps and village houses; furthermore, its venom is astonishingly rapid in its effects. It reaches a length of four feet, has smooth scales, a ridge along the spine, no hood, and is bluish or brownish black with highly variable bars and markings of yellow and white. Other deadly species of the same genus of bungars or rock-snakes are the larger *raj-samp* or «king-snake» (*B. fasciatus*), noted for its active killing of cobras and other snakes; and other species in Ceylon and the Indo-Chinese region. Consult the works of Fayrer and of Ewart on the poisonous snakes of India, and the 'Proceedings' of the Zoological Society of London for 1899.

Krakatoa, a volcanic island in Sunda Strait, between Sumatra and Java; area, 6 square miles, formerly about 12 square miles. The island, now uninhabited, is known as having been the scene of a terrific volcanic eruption on the night of 26-27 Aug. 1883. The volcano had been practically inactive for over 200 years until May of 1883, when there were indications of an eruption, which culminated at the date mentioned. A number of explosions occurred, the noise of which was heard for many miles. A mass of rock, in the form of dust, ashes, and small stones, and of the volume of about a cubic mile, was thrown up for a considerable distance. The dust was projected, vertically, nearly 20 miles, and distributed to all parts of the globe by the upper air currents. The effect, especially as shown in brilliant sunrises and sunsets, was visible for many months. The disturbance created a series of extensive sea-waves which swept over the shores of Java and Sumatra, destroying many villages and causing the loss of more than 30,000 people. The wave-motion was observed in South America. About one-half of the island was destroyed, including the highest mountain. One immediate effect was the darkness which alarmed many people, and which made 27 Aug. 1883 known as one of the dark days.

Kraken, krā'- or krā'kĕn, the term, of Norwegian origin, applied to a fabulous sea-monster, generally assumed to be a gigantic squid (q.v.). It was first described by Pontoppidan, bishop of Bergen in Norway, but other old writers have accounts of substantially the same kind of monster. It is described as of enormous size; rising from the sea like an island about 1½ miles in circumference, with enormous mast-like arms with which it wrecked ships, created whirlpools, and realized all that was prodigious and strange in size, habits, and appearance. The kraken stories led to a similar creation by Victor Hugo in his 'Toilers of the Sea,' which, considered zoologically, is almost as far from possible truth as was that of old Pontoppidan.

Kra'nach, Lucas. See CRANACH.

Krausé, Lyda Farrington, «BARBARA YECHTON,» American novelist and writer for young people: b. Saint Croix, W. I., 1864. She was for many years on the staff of 'The Churchman' in New York, and among her published books are: 'Christine's Inspiration' (1892); 'Toinette' (1897); 'A Young Savage' (1899); 'Fortune's Boats' (1900).

Krausse, krows, **Alexis Sidney,** English author and publicist: b. Islington, London, 1859. He was educated at University College, London, has since devoted much time to foreign, especially Asiatic history and policy, and has been an industrious contributor to newspapers and magazines. Among the books he has published are: 'Starving London' (1886); 'China in Decay' (1900); 'Russia in Asia' (1899); 'The Story of the China Crisis'; 'The Far East, its History and its Question' (1900).

Krefeld, krā'fĕld, or **Crefeld,** Prussia, a town in the government of Düsseldorf, 12 miles northwest of the town of Düsseldorf, and about four miles west of the Rhine. It consists of straight spacious streets and well-built houses; is the seat of several courts and public offices; contains churches for Roman Catholics, Old Catholics, Protestants, Mennonites, and Jews; a royal textile college, gymnasia, a monument of Moltke erected in 1897, hospitals, etc.; and is the principal locality in Prussia for the manufacture of silk and mixed silk goods, which was introduced by refugees from Juliers and Berg in the 17th and 18th centuries. The number of factories producing silk goods is about 120, exclusive of nearly 50 silk-dyeing works. The town also contains railroad shops, boiler-works, machine-shops, iron-foundries, chemical works, distilleries, sugar-refineries, soap-works, tanneries, paper-mills, etc. Krefeld came into the possession of Prussia in 1702, and except during the Napoleonic ascendency it has remained with her ever since. Pop. (1890), 105,376; (1900), 106,928.

Krehbiel, krā'bēl, **Henry Edward,** American musical critic: b. Ann Arbor, Mich., 10 March 1854. He was musical critic successively on the Cincinnati *Gazette* and the New York *Tribune*. His published works include: 'The Technics of Violin Playing' (1880); 'How to Listen to Music' (1896); 'Studies in the Wagnerian Drama' (1891); 'The Philharmonic Society of New York: a Memorial' (1892); 'Music and Manners in the Classical Period' (1898); 'Music of the Modern World' (1897). He also edited an 'Annotated Bibliography of Fine Art' (1897).

Krem'lin, a Russian citadel, especially the citadel of Moscow (q.v.). It lies in the centre of the city, and contains the royal edifices and churches, particularly the residence of the emperor.

Kremnitz, krĕm'nĭts, or **Cremnitz,** Hungary, a free mining town (called in Hungarian Körmöczbánya), in the county of Bars, in a deep valley surrounded by lofty hills, 15 miles northeast of Schemnitz. It consists of the town proper, surrounded by walls, and containing a castle; and of several large suburbs, in which are almost all the public buildings. There are some old churches, a Franciscan monastery of the 17th century, a mint, hospitals, etc. The manufactures consist of paper, delft-ware, vitriol, and cinnabar; but the prosperity of the town depends chiefly on the gold and silver mines in the vicinity. Pop. about 10,000.

Kre'osote. See CREOSOTE.

Kriegspiel, krēg'spēl («war-game»), a game of German origin, played with maps on a large scale, and colored metal blocks, on the same scale as the map, representing bodies of troops of various strength (brigades of infantry, battalions of rifles, regiments of cavalry, besides artillery, engineers, etc.). The players are usually two on each side, and the game forms an exact miniature of tactical operations. It is played by alternate moves; each move represents the lapse of two minutes, and rules are given to determine the distance that each branch of the service may move over in that time. When two bodies of men on opposite sides come into contact, the weaker in numbers and position is held to be defeated; but when they are equal in these respects victory is determined to one side or the other by the use of a die.

Krieker, krē'kėr, a gunner's name for jack-snipe (q.v.).

Kris. See Creese.

Krishna, krĭsh'nạ, in Hindu mythology, the eighth avatar of Vishnu and the most popular deity in the Hindu pantheon. See Avatar; Vishnu.

Kriss Kringle, a sort of St. Nicholas. On Christmas eve, Kriss Kringle, arrayed in a fur cap and strange apparel, goes to the bedroom of all good children, where he finds a stocking or sock hung up in expectation of his visit, in which depository he leaves a present for the young wearer. The word means Christ-child, and the eve is called Kriss-Kringle eve. See St. Nicholas.

Kronstadt, krŏn'stät, or **Cronstadt,** Russia, a maritime fortress in the government of St. Petersburg, and about 25 miles west of that city. It stands in the narrowest part of the Gulf of Finland, opposite to the mouth of the Neva, on a height of the long, narrow, rocky island of Kotlin, forming, both by its position and the strength of its fortifications, the bulwark of the capital, and the most important naval station of the empire. It was founded by Peter the Great in 1710, and has spacious, regular streets, with many handsome houses; Greek, Lutheran, English, and Roman Catholic churches; very large marine establishments, a navigation school, a naval arsenal, a cannon-foundry, a barracks, building-yards, docks, etc. The harbor consists of three separate basins — a merchant haven, capable of containing 1,000 ships; a central haven for the repair of ships of war; and the war haven, which, in addition to the other works of the place, is defended by the strong fort of Kronslot, built on two small adjoining islands. The chief disadvantage of Kronstadt as a port is the long period during which the harbor is blocked up by ice. The construction of a canal affording better access by sea to the capital has diminished the trade of Kronstadt, which in consequence will cease to be a commercial port. Pop. (1897) 59,539.

Kropotkin, Peter Alexeievitch, pā'tėr ā-lĕk-sĭ-ā'vĭch krō-pŏt'kĭn, Russian geographer and revolutionist: b. Moscow 9 Dec. 1842. He was educated in the Corps of Pages at St. Petersburg, and joining a regiment of Cossacks of the Amur went to Eastern Siberia as aide-de-camp to the military governor of Transbaikalia, becoming later attaché for Cossacks' affairs to the governor-general of Eastern Siberia. He was connected with a prison commission and strove to get some reforms introduced into Siberian convict prisons, but his efforts proved of no avail. From 1863 he devoted his energies to a scientific investigation of Manchuria and the neighboring parts of Siberia, and his work in this department gained him the gold medal of the Russian Geographical Society in 1864. In 1871 he was sent by the Geographical Society to Finland to study glacial phenomena. Arrested in 1874 for promulgating radical ideas of social reform, he was confined in the prison of the military hospital, from which he contrived to escape to England in 1876. In the following year he went to Switzerland, where he founded at Geneva an anarchist journal called 'Le Révolté,' but in 1881 was expelled by the Swiss authorities on the demand of Russia. Returning to England in 1882, he wrote and lectured against the government of Alexander III. Having gone to France, he was arrested by the authorities and condemned (Jan. 1883) to five years' imprisonment for participation in the International, but he was released in January 1886, in consequence of a strong appeal made by leading French and English savants. Since then he has lived chiefly in London, engaged in literary work. He has written much on scientific subjects and has contributed to various encyclopædias. His separate publications include: 'Paroles d'un Révolté' (1885); 'In Russian and French Prisons' (1887); 'La Conquête du Pain' (1888); 'L'Anarchie, sa Philosophie, son Idéal' (1896; Eng. trans. 1897): 'The State: its Part in History' (1898); 'Fields, Factories, and Workshops' (1899); 'Memoirs of a Revolutionist,' first issued serially in 'The Atlantic Monthly' (1899). Prince Kropotkin is one of the ablest representatives and most eloquent exponents of that theory of society known as anarchist-communism. He is opposed to all societies based on force or restraint, and looks forward to the advent of a purely voluntary society on a communistic basis. He desires to see the division of labor, which is the dominant factor in modern industry, replaced by what he calls the «integration of labor,» and is a stanch believer in the immense possibilities of intensive agriculture. In 1901 he delivered a course of lectures at the Lowell Institute in Boston.

Krout, Mary H., American journalist: b. Crawfordsville, Ind., 3 Nov. 1857. She was for 10 years on the staff of the Chicago *Inter-Ocean,* has traveled extensively as a staff correspondent and is the author of 'Hawaii and a Revolution'; 'A Looker-on in London' (1899); 'Alice in the Hawaiian Islands' (1899); etc.

Kruger, kroo'gėr, **Stephanus Johannes Paulus,** Boer statesman: b. Colesberg, Cape Colony, 10 Oct. 1825; d. Clarens, Switzerland, 14 July 1904. At 11 he accompanied his parents in the «great trek» or migration of Boers, whom the British administrators had antagonized, from the Cape Colony, — a movement which resulted in the colonization by Boers of Natal, the Orange Free State, and the Transvaal. He and his parents resided for a time in the Orange Free State, but they ultimately made their home north of the river Vaal. At 16 he was assistant to a field cornet, and not long afterward became a field cornet himself. From that time he was constantly connected with either the military or the civil government of the

From "Memoirs of a Revolutionist."

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PRINCE KROPOTKIN,
The Russian Revolutionist.

Transvaal, and his force of character gradually brought him to the front. In 1863 he became commandant-general, and in that capacity put down civil feuds and defeated the Basutos. At the time of the annexation of the Transvaal to the British territories in 1877 he was vice-president under President Burgers. Upon the reorganization of the Boer government by the national committee in 1880, he again assumed the office of vice-president, and in the war of 1880–1 with Great Britain, he took a leading part. He was elected president in 1883, and re-elected in 1888, 1893, and 1898. He visited England in 1883 in order to obtain a revision of the Pretoria Convention of 1881, and before his return in the following year he secured its replacement by a new convention practically granting independence — except in so far as relations with foreign countries were concerned — and authorizing the renaming of the State as the South African Republic. Kruger's position in the republic was now one of almost unlimited influence and authority. The enormous influx of foreigners after the discovery of the rich gold deposits of the Witwatersrand created problems of the utmost gravity. The greed of the British South African Company was extreme, the Uitlanders complained of injustice, and the Boers on their part were determined to resist foreign aggression. A crisis presented itself in the so-called ‘Jameson Raid’ (q.v.) of December 1895, which was easily crushed by the Boers, and at the same time led them to look forward to another and greater struggle with the English and to accumulate a large supply of military stores. Kruger managed with much diplomatic skill the difficult matters connected with this affair. In the second war with Great Britain Kruger remained in the country till the fall of Pretoria (5 June 1900), then escaped into Portuguese territory, and thence 19 Oct. sailed for Europe, hoping to enlist some of the European powers on behalf of the Boer republics, but failing in this he took up his residence in the Netherlands. In the summer of 1901 he proposed visiting the United States for the purpose of inducing the government to give its moral support to the Boers, but on being informed that neither President McKinley nor after him President Roosevelt would receive him in other than a strictly unofficial manner, the project was abandoned. His wife died at Pretoria in July 1901. See also SOUTH AFRICAN WAR. Consult: Van Dordt, ‘Paul Kruger’ (1900); Statham, ‘Paul Kruger and his Times’ (1898).

Krummacher, Friedrich Adolf, frēd′rĭʜ ä′dōlf kroom′mäʜ-ĕr, German theologian: b. Tecklenburg 13 July 1767; d. Bremen 4 April 1845. A minister in the German Reformed Church and a professor of theology, he became widely known by his ‘Parables’ (1805), which ran through many editions and are familiar in an English translation. They were as a rule short, written in simple prose, on such subjects as ‘The Blind Man,’ ‘Life and Death,’ ‘The Hero,’ etc. None of his other writings won popularity.

Krupp, kroop, **Alfred,** German inventor and metallurgist: b. Essen, Prussia, 26 April 1812; d. there 14 July 1887. He was a son of Friedrich Krupp (q.v.). In 1848 he assumed charge of the Krupp Steel Works at Essen and presently discovered the method of casting steel in very large masses. In 1851 he sent to the London Exhibition a block of steel weighing 4,500 pounds, and was able to cast steel in one mass weighing more than 100,000 pounds. Although he manufactured a great variety of articles for use in various peaceful industries, his world-wide fame arose from his production of the enormous siege guns used by the Germans when they invested Paris. Several of Krupp's processes in the manufacture of steel and in the making of cannon were very carefully kept from the knowledge of the outside world and only employees were admitted to his foundries.

Krupp, Friedrich, frēd′rĭʜ, German manufacturer: b. 1787; d. 1826. He established a small forge at Essen, Rhenish Prussia, in 1870, experimented in the making of cast-steel, the secret of which was then carefully kept in Great Britain, and was able in 1812 to manufacture some of the material. In 1818, on the site of the present large Krupp establishment, he built a small plant of eight melting furnaces, each with one crucible. He turned out a steel of excellent quality, though not perfectly successful; but demand for the product was then slight, despite its use for mint-dies and some other purposes, and the activity of the manufactory was correspondingly small.

Krupp, Friedrich Alfred, German gunmaker: b. Essen, Germany, 17 Feb. 1854; d. there 22 Nov. 1902. He was known as the «Cannon King» in Germany and was the son of Alfred Krupp, who invented a new Bessemer steel, out of which he made rifles and cannons, a seamless tire for car-wheels; and discovered a new method of hardening armor plate. His grandfather, Friedrich Krupp (q.v.), founded the steel industry of Essen, beginning in 1817 with two laborers. The present Krupp works cover 150 acres, and the daily output is about 1,877 tons. The Krupps have been head of the iron and steel industry of Prussia for many years; their establishment is one of the greatest in the world. Friedrich Alfred Krupp was the richest man in the empire. He was generous to his operatives, built for them 5,469 dwellings, each with its garden, besides providing convalescent hospitals and orphanages. He also maintained a pension fund of $4,125,000 for their benefit. He vastly improved the capacity of the business by taking in other steel works at Rheinhausen and in the neighborhood of Magdeburg; acquiring coal mines in Germany, and iron mines in Spain, as well as in Germany. The shipyards and engine shops of Kiel and Berlin which he amalgamated with the mining and founding business, were sources of great wealth, and he owned a fleet of steamers for the exportation of his goods. Thus although he took no active part in his business on its technical side (in which he differed from his father and grandfather) his skill in finance was so great that in 15 years he almost doubled his inherited fortune. Compare: ARMOR-PLATE; IRON AND STEEL INDUSTRY; and ORDNANCE.

Krupp's Steel. See STEEL.

Krutt′schnitt, Ernest Benjamin, American publicist and lawyer: b. New Orleans 17 April 1852; son of John and Peninah (Benjamin) K. He studied three years at Washington College (1867–70), and then entered its law school, being admitted to the bar in 1874. He has occupied many positions of prominence in New Orleans, and was particularly interested in its public schools, being since 1890 president of the board of directors. In 1898 he received the degree of LL.D. from Washington and Lee University. He was chairman of the Democratic State Executive Committee (1892–6) and later chairman of the Democratic State Central Committee. In 1898 he was elected president of the Louisiana Constitutional Convention.

Kryp'ton, a gaseous element discovered in the atmosphere by Ramsay and Travers, in 1898. (The history of this member of the argon group is so bound up with that of argon itself, that reference should be made to the article ARGON, and to the references there given.) Krypton was discovered in the last fraction remaining after the evaporation of a considerable quantity of liquid air. The residue consisted chiefly of argon, oxygen and nitrogen; but when the oxygen and nitrogen had been removed, a spectroscopic examination of what remained showed lines that indicated the existence of at least one new element, in addition to argon and helium. To this new element the name «krypton» was assigned, from a Greek word signifying «hidden,» in allusion to the circumstances under which the discovery was made. (See also NEON and XENON.) Little is known, as yet, concerning the properties of krypton. When it was isolated by means of a tedious diffusion process, it was found by Ramsay and Travers to have a density about 40.75 times as great as that of hydrogen, and an atomic weight of about 81.5. The ratio of its specific heat at constant pressure to its specific heat at constant volume was found to be 1.66, as in the cases of argon and helium. Subsequent experiments by Ladenburg and Krügel have indicated a density of about 29.5, and therefore an atomic weight of about 59. Travers, in his book issued subsequently to these later experiments, makes no reference to them. Considerations based upon the periodic law (q.v.) appear to indicate that the results of Ramsay and Travers are the more probable; but this point is as yet undecided. Krypton exists in the air in the proportion of about one part in a million. It has the chemical symbol Kr, and appears to be as inert, chemically, as argon.

Ktistola'træ. See MONOPHYSITES.

Ku-klux (kū'klŭks) **Klan,** a secret organization founded at Pulaski, Tenn., in 1866. Formed originally for purposes of amusement only, it soon developed into an association of «regulators,» and became notorious for the lawless deeds of violence performed in its name. The proceedings of the Ku-Klux in the Southern States were a feature of the determined struggle to withhold from the emancipated slaves the right of voting. The outrages and murders which convulsed the country in 1868–9 ended in the calling out of troops and the formal disbandment of the society in March of the latter year; but its name and often its disguises were used for years to cover the violence of political desperadoes. At the first meeting in 1866 a name was suggested — «Ku-Kloi,» from the Greek «Kuklos,» a band or circle. On the mention of this name some one cried out, «Call it ‘Kuklux.’» Nearly all present were Tennesseeans, with only one or two from farther south. On the name being pronounced, a Georgia man present remarked: «Kuklux, that sounds like ‘Coclets,’ our old society, called the ‘Lost Clan of Coclets.’» The Coclets Indians were a clan, not a tribe, that had existed some 200 years previously. The name was adopted and the society provided for the following officers: A Grand Cyclops or President; a Grand Magus or Vice-President; a Grand Turk or Marshal; a Grand Exchequer or Treasurer, and two Lictors. There were the outer and inner guards of the «Den,» as the place of meeting was designated. Each member was required to provide himself with the following outfit: A white mask for the face, with orifices for the eyes and nose; a tall, fantastic cardboard hat, so constructed as to increase the wearer's apparent height, and in shape like those placed on the heads of the heretics formerly burnt in the Portuguese and Spanish *auto-de-fes;* a gown or robe of sufficient length to cover the entire person. The color and material were left to the wearer's fancy, and each selected what would in his judgment be most hideous and fantastic. Each member carried also a small whistle, with which, by means of a code of signals agreed on, they held communication with one another. The Klan increased in numbers and in power, an *imperium in imperio,* until its decrees were far more potent and its powers more dreaded than that of the visible commonwealths which it either dominated or terrorized. In April 1867 the Grand Cyclops of the Pulaski den sent out a request to all the dens scattered over the South to appoint delegates to meet in convention at Nashville, Tenn., in the early summer of 1867. At the time appointed this convention was held. Delegates were present from the Carolinas, Alabama, Georgia, Louisiana and other Southern States. A plan of reorganization previously prepared was submitted to the Convention and adopted, and the delegates returned to their various States as secretly as they had come.

The grand officers were: The Grand Wizard of the Invisible Empire and his ten Genii. The powers of this officer were almost autocratic. The Grand Dragon of the Realm and his eight Hydras; the Grand Titian of the Dominion and his six Furies; the Grand Cyclops of the Den and his two Nighthawks; a Grand Monk; a Grand Exchequer; a grand Lictor; a Grand Scribe; a Grand Turk; a Grand Sentinel. The Genii, Hydras, Furies, Goblins and Nighthawks were staff officers. The gradation and distribution of authority were perfect.

One of the most important things done by this Nashville convention was to make a positive and emphatic declaration of the principles of the order. It was in the following terms:

«We recognize our relations to the United States Government; the supremacy of the Constitution; the constitutional laws thereof; and the union of the States thereunder.»

This Nashville convention also defined and set forth the peculiar objects of the order as follows:

1. To protect the weak, the innocent, and the defenseless from the indignities, wrongs, and outrages of the lawless, the violent and the brutal; to relieve the injured and the oppressed; to succor the suffering, and especially the widows and orphans of Confederate soldiers.

2. To protect and defend the Constitution of the United States and all laws passed in con-

formity thereto, and to protect the States and people from all invasion from any source whatever.

3. To aid and assist in the execution of all constitutional laws, and to protect the people from unlawful seizure, and from trial except by their peers in conformity to the laws of the land.

The Klan had a very large membership; it exerted a vast, terrifying and wholesome power, but its influence was never at any time dependent on or proportioned to its membership. A careful estimate placed the number of Kuklux in Tennessee at 40,000, and in the entire South at 550,000. The organization was disbanded in March 1869.

Kubelik, Jan, yän koo'bĕ-lēk, Bohemian violinist: b. Miehle, near Prague, 1880. He studied at the Prague Conservatory and subsequently performed at semi-private musicales. In 1898 he appeared at a public orchestral concert and in 1900 with the Berlin Philharmonic Society, and made his début in London in June of that year. Subsequently he made a brief but successful tour on the Continent and in England, and in December, 1901, came to the United States, where he was most enthusiastically received.

Kûblai Khan, koob'lī khän (more properly Khübilai Khan), called by the Chinese Chi-Tson, Mongol emperor: b. 1214; d. 1294. He was the founder of the twentieth Chinese dynasty, that of the Mongols or Yuen. He was a grandson of Genghis Khan, and in 1259 succeeded his brother Mangû as Khagan or Grand Khan of the Mongols, and in 1260 he conquered the whole of northern China, driving out the Tartar or Kin dynasty. He then ruled over the conquered territory himself, and 19 years later added to it southern China, the dominion of the Song dynasty, which had originally summoned his assistance in driving out the Tartars from the north. Kûblai thus became sole ruler of an empire extending over a large part of Asia, as well as over those parts of Europe that had belonged to the dominion of Genghis Khan. He repaired the evils of so many wars by a wise administration, and by the encouragement which he gave to letters, commerce, industry, and agriculture, brought them all to a very flourishing condition. Marco Polo, the celebrated Venetian traveler, who lived 17 years at the court of this prince, gives some interesting information regarding him. Kûblai Khan is the subject of a poetical fragment by Coleridge.

Kuch Behar. See Cooch Behar.

Kuen-lun, kwĕn-loon', a great mountain system of central Asia, between the Himalayas on the south and the Thian-Shan on the north. It extends from the Pamir plateau in about lon. 75° E. eastward into China, terminating in about lon. 120° E. It varies in breadth, both extremities being compressed, its middle portion consisting of numerous more or less parallel chains. Nearly the whole group is between lat. 30° and 40° N. The most northern part on the west is a continuous mountain-wall having several names and being farther continued by the Nan-shan and other chains well into China. Toward the south are three roughly parallel shorter ranges, the last of which, with its eastern continuations, forms the southern boundary of a mountainous region in which are the Tsaidam salt waste and the Koko-Nor lakes. Between the last named group and one farther south the Hoang-ho rises. The most southerly chain of the central Kuen-lun is that of the Yang-la Mountains. The greatest elevation of the Kuen-lun is in the western ranges, and reaches over 22,500 feet, while the chief western ranges average about 20,000 feet. Most of the peaks of the eastern chains, in China proper, are under 17,000 feet.

Kugler, Franz Theodor, fränts tā'ō-dōr koog'lĕr, German writer on art: b. Stettin 19 Jan. 1808; d. Berlin 18 March 1858. He was appointed a professor of fine arts in the University of Berlin in 1833, and subsequently became a member of the Academy of Berlin. His works have undoubtedly exercised great influence on German art and culture; notably a ‘History of Painting from Constantine the Great to the Present Times’ (1837); ‘Handbook of the History of Art’ (1841–2); ‘History of Architecture’ (1856). He also wrote a ‘History of Frederick the Great’ (1840), which is popular in Germany. His ‘History of Art’ was continued by W. Lübke (q.v.).

Kuhns, koons, **Oscar,** American educator and author: b. Columbia, Pa., 21 Feb. 1856. He was graduated from Wesleyan University in 1885 and has been professor of modern languages there from 1890. He has written ‘The German and Swiss Settlements of Colonial Pennsylvania’ (1900); ‘The Treatment of Nature in Dante's Divina Commedia’ (1897); etc.

Kulturkampf, kool'toor-kämpf, a German term denoting the contest for political and legal rights waged between the authorities of Germany on the one hand and the authorities of the Roman Catholic Church on the other. The conflict was initiated by Bismarck in 1872 and had for its main point of dispute the control by the State of educational and ecclesiastical appointments. He urged that the declaration of Papal infallibility by the Vatican council in 1870 was an arrogation of rights dangerous to the state and that the Roman Catholic Church had assumed an attitude of aggression dangerous to the laws of the state. The ill feeling arising from the questions at issue led the Reichstag to pass a law in 1872 expelling the Jesuits from the German empire. The outbreak of the Kulturkampf, however, dated from the enactment of the May Laws (1873) aiming at state control of the clergy. The Roman Catholic bishops, clergy, and people refused to recognize the validity of the new laws. This opposition was met by still more drastic government measures and in 1875 all recusant priests were deprived of their salaries and all religious orders were abolished. The accession of Pope Leo XIII. prepared the way, however, for a resumption of friendly relations between the Imperial government and the Roman Catholic Church, and negotiations began in 1878 resulting in a nullification of the laws of 1873.

Kumas'si. See Coomassie.

Kumiss, koo'mĭs, a preparation of milk, whether cow's, mare's, ass's, or goat's, which is said to possess wonderful nutritive and assimilable properties, so that it is very valuable in the treatment of consumption, scrofula, chronic diarrhœa, and debility and emaciation in general. It consists essentially of milk in process of fermentation, and cow's milk is what is used for making it in Great Britain. On the Asiatic steppes, where it has been long used as a beverage, it is made of mare's milk, but kumiss of mare's milk or goat's milk has a somewhat unpleasant smell. The manufacture of kumiss is carried on in Switzerland, Russia, and elsewhere. An analysis of a Swiss variety showed that it was composed of fully 90 per cent of water, nearly 3¼ of alcohol, rather more than 2 of sugar, about 1¾ each of butter and albuminates, besides lactic acid, free carbonic acid, and inorganic salts.

Kumquat, kŭm'kwŏt, a tree about six feet high, one of the *Citrus* group, closely related to the orange and growing in China and Japan. There are groves of it in the island of Chusan. The fruit, which is oval, is about the size of a gooseberry, and has a sweet rind and an acid taste. The Chinese make preserves of it, which are largely sold in American cities.

Kuntze, koont'sĕ, **Edward J.**, German-American sculptor: b. Pomerania 1824; d. United States 1870. After studying in the Academy of Fine Arts, Stockholm, Sweden, he took up his residence in London, but eventually (1844) went to New York, where he was elected Associate of the National Academy (1869). His reputation was made in the United States by his statuettes, among which that of Lincoln was extremely popular. He also executed figures of Shakespeare and Goethe on the same scale; while his statue of 'Psyche,' his bust of 'Mirth,' and his medallion portraits are all in their way excellent.

Kunz, koonz, **George Frederick**, American gem expert: b. New York 29 Sept. 1856. He was educated at Cooper Union, and became a special agent of the United States Geological Survey in 1883. He was placed in charge of the department of mines at the Omaha, Atlanta, World's Columbian and Paris Expositions. He has been president of the New York Mineralogical Club and vice-president of the American Institute of Mining Engineers, and is a member of many societies at home and abroad. Beside contributing innumerable papers on gems, minerals, etc., to magazines and reviews, he has published 'Gems and Precious Stones of North America'; and annual reports on the 'Production of Precious Stones,' in 'Mineral Resources of the United States,' etc.

Kunz'ite, the name of a recently discovered precious stone found in southern California; so called in honor of Dr. George F. Kunz, the special agent in charge of precious stones, United States Geological Survey, since 1882. It is a brilliant gem and is between the topaz and pink sapphire in color. A rose-lilac is the tint which marks this stone, a color new among gems; and its radiance is peculiar and beautiful.

Kunzite was brought to light in 1902 near Pala, in San Diego County, Cal., and was sent for classification to Dr. Kunz, the eminent mineralogist of New York. Much attention was attracted by the beautiful lilac-colored crystals, for nowhere in the country, not even in the American Museum of Natural History at New York, which has the finest collection of spodumene, under which the new gem was classed, had there been seen such remarkable and perfect specimens as these. Dr. Kunz identified the gem and described it; but Dr. Charles Baskerville, professor of chemistry in the University of North Carolina, finally subjected it to ultra-violet light, then to the rays of high penetrative power, and lastly to the bombardment of the corpuscles shooting out from radium, which resulted in some wonderful effects new to the scientific world. Of these effects Dr. Charles Baskerville, who took the liberty of naming the gem «Kunzite,» for his friend, gives the following account:

«On examining this gem we directed our attention to discovering the effect of radium on precious stones. It was shown early in the experiments of the French mineralogist, Curie, that many diamonds phosphoresce, that is, glow in the dark, after being exposed to the emanations of radium. All diamonds phosphoresce with radium, as we learned by applying the test to about two thousand gems collected from some fifteen thousand. The gem in which we were particularly interested belongs to the class of spodumene. Mineral spodumene is usually obtained in large opaque whitish crystals, but from time to time small specimens, often richly colored and transparent, are found. The three characteristic varieties of the latter are a clear yellow gem spodumene of Brazil, the green hiddenite, or lithia emerald of North Carolina, and the lilac sometimes found in Connecticut. These are without doubt remnants of large specimens, which must have been elegant. Spodumene is very subject to alteration and has usually lost all its transparency and beauty of tint.»

The California spodumene crystals are of a rose-lilac tint, varying with the spodumene dichroism, from a very pale tinge when observed transversely to the prism, to a rich amethystine hue longitudinally. No such crystals of spodumene have ever been seen before, and the discovery is of great mineralogical interest. The crystals have been etched by weathering and have a twinning like the hiddenite variety. When cut and mounted parallel to the base, they yield gems of great beauty. Baskerville, Kunz and Crookes have found this almost as luminously responsive to the action of radium as the diamond.

Kurdistan, koor-dĭs-tän' (Persian, «land of the Kurds»), an extensive territory of western Asia, comprehending the greater part of the mountainous region which borders on the western side of the great plateau of Iran or Persia, and stretches westward till it overhangs the low plains of Mesopotamia on the southwest, and reaches the borders of the Turkish provinces of Diarbekir and Erzerum on the northwest. Its limits, as nearly as they can be defined, lie between lat. 34° and 39° N.; and lon. 42° and 47° E., with an area of nearly 40,000 square miles. The surface is very mountainous, and is traversed by lofty ranges stretching northwest to southeast. The whole surface on the west of the Persian frontier is drained by the Tigris and the Euphrates and their tributaries. Unless Lake Van is considered as partly within the territory, there are no lakes of any consequence. The mountains are covered with forests of oak and other hard timber. Many of the valleys are under regular culture, with corn-fields, orchards, and vineyards. One of the most remarkable vegetables is manna, expressively called in Turkish *Kudret-hal-vassiz*, or the Divine sweet-meat, which is used as food. Fine horses and oxen are bred, and sheep and goats are kept in large numbers.

The Kurds are a stout, dark race, well formed, with dark hair, small eyes, wide mouth, and a fierce look. Most of the men are armed, using lances, sabres, daggers, muskets, and pistols. Many of the tribes are still nomadic. The language is of the same stock as the modern Persian. The great body of the Kurds are Mohammedans. They care little for trade, although they send to Kirkuk, Hamadan, etc., gall-nuts, tobacco, honey, sheep-skins, and cattle; obtaining in return coffee, rice, leather, and clothing, chiefly cotton goods. Their allegiance to the Turkish sultan is but slight. The famous Sultan Saladin was a Kurd. It is very difficult to form even an approximate estimate of the whole Kurd population; the Turkish portion is supposed to contain about 2,500,000, and the Persian portion 400,000; but another estimate would give for these numbers 1,300,000 and 500,000 respectively.

Kuria Muria (koo'rē-ä moo'rē-ä) **Islands,** a group of islands situated off the southern coast of Arabia at distances varying from 10 to about 30 miles, with a total area of over 25 square miles. Guano deposits are found in these islands, but they are considered to be barren, and have very few inhabitants. In 1854 they were ceded to Great Britain.

Kuriles, koo'rĭlz, a chain of islands in the North Pacific Ocean, belonging to Japan (q.v.). The chain extends southwest to northeast from lat. 43° 40′ to 51° N.; lon. 145° to 156° E. They are divided into the Great and the Little Kuriles.

Kuroshiwo, koo-rō-shē'wō (Japanese, «black current»), a current of the Pacific Ocean somewhat analogous to the Gulf Stream. It takes its origin in the great north equatorial current along the southeast of Asia, flows past the Philippine Islands and Formosa, which somewhat deflect it, past Japan, the Kuriles and the Aleutian Islands, and thence bends southward toward California. As it approaches the American coast the current increases in breadth. It is much inferior to the Gulf Stream both in volume and in high temperature. It was formerly thought that the Kuroshiwo had a moderating effect upon the Pacific coast climate of this continent, but this view has been abandoned by reason of the scientific knowledge that the prevailing winds of the North Pacific bring eastward the warmth and moisture which produce the climatic moderation observed upon its shores.

Kurtz, koorts, **Charles M.,** art expert: b. Pennsylvania about 1855. He was graduated from Washington and Jefferson College in 1876, studied at the National Academy of Design (New York), was for some time on the staff of the New York *Tribune,* was nine years editor of ‘National Academy Notes,’ and edited the ‘Art Union Magazine’ in 1884. In 1891 he withdrew from journalism and was appointed assistant chief of the department of fine arts in the World's Columbian Exposition (Chicago 1893). In 1894–9 he was art director of the St. Louis annual exposition, in 1899 was appointed assistant director of fine arts for the United States at the Paris exposition of 1900, and in 1901 assistant chief of the department of art at the Louisiana Purchase exposition.

Kusi, koo sē. See Coosy.

Kuskoquim, kŭs'kō-kwĭm, Alaska, the second river in size in the Territory, rising on the northern slopes of Mount McKinley, and after a southwestern course of over 500 miles, flowing through the wide estuary of Kuskoquim Bay into Bering Sea, about 200 miles south of the Yukon Delta. The trading stations along its banks are Kolmakof, Oknagamut, Odgavigamut, Gavimamutt and Bethel. The inhabitants in the region are chiefly Indians and Eskimos. Gold was discovered in the valley of the Kuskoquim in 1903.

Kutchin, kŭ-chĭn', a name given to the tribes of the Athabascan Indians who live near the Yukon River in Alaska, and in British North America. They are also called Loucheux and Quarrelers. They number less than 2,000.

Kutztown, koots'town, Pa., borough in Berks County, on the Philadelphia & R. railroad, 18 miles northeast of Reading. There is a normal school here and manufactures of flour, leather, shoes, hosiery, etc. Pop. (1900) 1,328.

Kuyp, Albert. See Cuyp, Albert.

Kuyper, kī'pėr, **Abraham,** Dutch theologian and politician: b. Maassluis, Netherlands, 1837. After a course of theology at Leyden he became a preacher, and in 1874 was elected member of the lower house of Parliament, or Second Chamber, where he formed the Anti-Revolutionary party. He soon afterward quitted parliamentary life and launched out into the career of a publicist and journalist, still leading his party with great éclat. In theology he is the leader of staunch Calvinistic orthodoxy, and is opposed to all «modernism.» In 1880 he founded in Amsterdam the Free University. His political organ is the ‘Standaard’; his religious organ the ‘Heraut.’ Among his works is ‘Ons Program’ (1880); he has also edited the works of the Polish reformer Jan Laski, and is well known in the United States from De Vries's English translation of his ‘Encyclopedia of Sacred Theology’ (1898).

Kwalhiokwa, kwăl-hē-ō'kwă, a tribe of Athabascan Indians, formerly living on Willopah River, Washington, near the Lower Chinook Indians. They are frequently confounded with the Owilapsh or Whilpah.

Kwanza, kwăn'zạ, or **Coanza,** kō-ăn'zạ, a large river of Portuguese West Africa. Rising in Lake Mussombo, it flows at first in a northeasterly direction, then north, and finally in a westerly and northwesterly course, and enters the Atlantic Ocean near lat. 9° 10′ S., not far south of Saint Paul de Loanda. In the lower part of its course there are many falls, the last being the Livingstone or Kambambe Falls, below which for a distance of about 170 miles the river is navigable for small steamers. Its total length is about 800 miles.

Kyanite, kī'ạ-nīt, or **Cyanite,** a native aluminum silicate, Al_2SiO_5, identical in composition with sillimanite and andalusite but very different in its physical properties. Its hardness varies on different faces from 4. to 7. Its specific gravity is 3.56 to 3.67. It is triclinic, the crystals usually being long-bladed, transparent or translucent, and of a beautiful sky-blue color in the centre. Stout crystals of a grass-green color occur in North Carolina. The finest specimens come from Faido, Switzerland, occurring in paragonite schist. Cyanite abounds throughout the New England and Middle Atlantic States.

Ky'anizing, a process for preserving timber, cordage, etc., from the effects of dry-rot, named from an inventor of the name of Kyan. It consists in immersing the material to be preserved in a solution of corrosive sublimate and water, in the proportion of 1 pound of the former to from 10 to 15 gallons of the latter, according to the strength required. The time during which timber must be allowed to remain in the solution depends upon its size and thickness. For boards and small timbers 24 hours are required for each inch of thickness. This process is now almost entirely disused, as wood is much better preserved by being saturated with kreosote or coal-tar.

Kym'ry. See CYMRI.

Kyrie Eleison, kĭr'ĭ-ĕ ĕ-lā'ĭ-sŏn (from the Greek *Kyrie eleēson*, «Lord, have mercy»), an invocation following the introit of the mass. It is almost the only part of the liturgy in which the Roman Catholic Church has retained the use of Greek words. Just after the introit the priest celebrating the mass and the servers repeat alternately three times «Kyrie eleison,» and then as many times in the same manner «Christe eleison,» and so on alternately. When it is sung the leading singer takes the part of the priest, and the choir that of the servers. The introduction of the Kyrie into the mass is attributed to Pope Sylvester I., in the beginning of the 4th century.

L

L the twelfth letter of the English and most of the other modern European languages. Its definitive form in the Greek alphabet is Λ, but in very early Grecian, Hebrew and Phœnician monuments it has the form 𐤋 or L. Its name in Hebrew and Phœnician is lamed and in Greek lambda.

The sound of l is produced when the tip of the tongue is brought into contact with the palate behind the upper front teeth, and, with the jaws apart, the breath is emitted. The sound of r is produced in nearly the same way, but in sounding the r the tongue is not in contact with the palate and may vibrate. Thus these two letters represent sounds that are much alike. But there are nations that cannot sound the r, as the Chinese and sundry other races; these substitute l for r: the technical name for this vice of utterance is lambdacism; the opposite vice is an inability to pronounce l, for which r is substituted, as by the Japanese. In languages whose syllabaries admit both these sounds the two letters are freely interchanged or confounded. In languages belonging to one common family, the Aryan, for example, a word which in one language has r, in another has l, and *vice versa;* examples: Lat. *prunus,* Eng. plum; Lat. *ulmus* (elm), Fr. *orme.* The like is seen in the formation of derivatives within one language. Thus in Latin the adjective termination *alis* (Eng. al, as in liberal) is changed to *aris* when the word has already an l: for example: from *peculium* comes *peculiaris,* from *auxilium, auxiliaris,* and *vice versa,* r for a like reason is changed to l: thus from *per* and *lucidus* comes *pellucidus,* from *inter* and *lectus, intellectus.* L is also substituted in one language for n in another; for example: Gr. *pneumon* (lung), Lat. *pulmo.* Or d and l are interchanged: Gr. *Odysseus,* Lat. *Ulysses;* the like is seen in the two Latin words *odor* and *olor;* and the Latin *lingua* was once written *dingua,* allied to Eng. tongue and Ger. *zunge.*

In Italian the l of Latin words is often changed to i: Lat. *planus, plumbum* (lead), Ital. *piano, piombo.*

In English l is often silent: palm, calm. In French *al* becomes *au; à le* becomes *au, cheval* (horse) plu. *chevaux;* and the English auburn is from Latin *alburnus.* In English and most of the other languages l, whether single or double, has one sound-value only, the same which it has in pale, pallid; but in French sometimes ll has a sound resembling that of lli in million: in Spanish ll may commence a word, for example: *llana* (wool), and is classed as a distinct alphabetic character: its sound-value is the same as that of ll in French.

L. E. L., the ***nom-de-plume*** initials of an English novelist, Letitia Elizabeth Landon, later Mrs. Maclean.

La, in music, the syllable which denotes the sixth note of the diatonic scale.

Laager, lä'gėr (Dutch, «a camp»), in South Africa, an encampment more or less fortified. The original Boer laager is an enclosure made of the wagons of a traveling party for defense against enemies.

Laaland, lâ'länd, or **Lol'land,** an island of Denmark, in the Baltic Sea. Its greatest length, southeast to northwest, is 36 miles; breadth, varying from 9 miles to 17 miles; area, 462 square miles. The surface, as implied by its name, meaning «low land,» is so very little raised above the sea, that parts of it along the coast are subject to frequent inundations; and for a considerable distance around it the water is so shallow that there are few places in which vessels drawing 8 feet can approach it without danger. The soil, consisting generally of a heavy loam, is very fertile, and yields excellent crops of corn. Beans, hops, and hemp are extensively grown. Varieties of hardwood timber are abundant. Pop. 65,550.

Laar, or **Laer, Peter van,** Dutch painter: b. Haarlem, Netherlands, 1590; d. sometime after 1658. Early in life he went to France, and subsequently visited Italy (1623). Here he mainly resided at Rome, where he became associated with Claude Lorraine, Poussin and Sandrart. He was small and crooked in stature, and was thus called by the Italians «Bamboccio,» and the comic scenes of rustic life painted in his style became known as «Bambocciads.» He returned to Haarlem in 1639. He painted pastoral and banditti scenes, fairs, and such like rural incidents, with spirited and vigorous brush, although his coloring is somewhat hard. A masterpiece of his, 'The Market Crier,' is in the gallery at Cassel. Other pictures of his are to be found at Paris, Dresden, Vienna, Munich, etc. About 20 etchings from his hand are also extant, chiefly animals and landscape, which are spirited and finely executed.

Labadie, Jean de, French mystic and separatist: b. Bourg en Guienne 13 Feb. 1610; d. Altona, Prussia, 13 Feb. 1674. He was educated at Bordeaux by the Jesuits, and belonged to their order till 1639. He then quitted it, both because irregularities were detected in his conduct, and he was found to have adopted many very peculiar and extravagant views. For these he was cited before the Parliament, but fled to Geneva. At a later period he returned to France, and took up his residence in Amiens, whose bishop entrusted him with the visitation of the monasteries in his diocese. He also found a patron in the archbishop of Toulouse. His zealous opposition to some of the clergy subjected him again to persecution, and to escape from it he, in 1650, went over to the Reformed Church, but not finding himself so comfortable as he expected, he thought he had received a call to found an apostolic church for himself. He now became a preacher in Montauban, and afterward, on being obliged to leave it, in the town of Orange, from which he proceeded successively to Geneva, Middleburg, and Amsterdam. In the last city he collected his followers into a distinct church or society under the name of Labadists. Toleration being now denied him, he in 1670 proceeded to Herford, where the Palsgravine Elizabeth gave him protection. Driven thence by an imperial edict in 1672, he went first to Bremen, and finally to Altona, where he held private meetings.

La Barca, lä bär'kä, Mexico, town in the State of Jalisco, east of Chapala, and 60 miles southeast of Guadalajara, on the International railroad between that city and the capital. The town was founded in 1529 by Nuño de Guzman, and during the Mexican war for independence the town was the scene of two serious battles. Pop. (1900) 10,000.

La Barre, Antoine Joseph Lefèvre de, French sailor: b. about the beginning of the 17th century; d. 4 May 1688. He rose to early prominence as an officer of the French navy, and was appointed governor of Guiana in 1663. He was successful in recapturing Cayenne which had been occupied by the Dutch. On being commissioned lieutenant-general he sailed for the West Indies, and, in a fight with the English in the Antilles, compelled them to raise the blockade of Saint Christopher. Succeeding Frontenac as governor of Canada in 1682, his irresolution in his negotiations with the Indians was so disastrous that he was recalled in 1684.

Lab'arum, the name given from the time of Constantine to the imperial banner. Eusebius has described it with much particularity. It was in the form of a long pike, crossed at a certain height by a beam, from which depended a banner richly embroidered with gold, and adorned with precious stones. The pike was surmounted by a crown of gold, enclosing within it a monogram of the two initial letters of the name of Christ.

Labat, Jean Baptiste, zhŏṅ băp'tēst lä-bä, French Dominican missionary and traveler: b. Paris 1663; d. there 6 Jan. 1738. In 1693 he went as a missionary to the French Antilles, landed at Martinique, and undertook the care of the parish of Macouba, which he superintended for two years, after which he was sent to Guadaloupe. His mathematical knowledge recommended him to the governor there, whom he accompanied during a tour through the island to assist him in selecting the points best adapted for works of defense. On his return to Martinique Labat received the office of *procureur-général* of the mission, in which an opportunity was afforded him of displaying the whole extent of his useful activity, at the same time that he served the government by his mathematical knowledge. In 1705 he was sent to Europe on business of the order, and landing at Cadiz, surveyed geometrically and scientifically the environs and the whole coast of Andalusia as far as Gibraltar. He returned to Paris in 1716. His ‘Nouveau Voyage aux Iles de l'Amérique,’ which has been translated into several languages, contains an account of the natural history, particularly of some of the smaller and less frequented islands; of their productions; the origin, customs, religion, and governments of the inhabitants. He also published a ‘Nouvelle Relation de l'Afrique occidentale’; ‘Voyage en Espagne et Italie’; ‘Relation historique de l'Ethiopie occidentale’; ‘Mémoires du chevalier d'Arvieu.’

Labédoyère, Charles Angélique Huchet, shärl än-zhā-lēk hü-shā lä-bā-dwä-yār, COMTE DE, French general: b. Paris 17 April 1786; d. there 19 Aug. 1815. He entered the army in his 20th year, and served with much distinction in Spain, Germany, and elsewhere. Napoleon raised him to the rank of general of division in 1815, and he fought with great courage at Waterloo. After the battle he hurried to Paris, and there distinguished himself by his hostility to the Bourbons. On the capitulation of Paris he followed the army behind the Loire, but returning to Paris, was taken, tried by court-martial, and shot.

Label, Union. See UNION LABEL.

Labezares, Guido de, gwē-dō dā lä-bä-thä'rĕs, Spanish adventurer: b. Bilbao, Spain, 1510; d. Manila 1580. He began his career in South America, from which he made a voyage to Java and Sumatra 1542. In 1550 he discovered the Bay Filipina, in Florida, and in the following year with Luna de Arellano visited and re-named the place Bay Santa Maria. He entered with Legaspi upon the project of conquering and converting the Philippine Islands. His success was complete in the matter of conquest and in 1574 he was appointed governor-general of Manila. By means of new fortifications he so strengthened the place against the Chinese corsairs and the Dutch pirates, that these were driven from the adjacent islands. In 1575 he took the position of lieutenant-governor, under a new governor-general sent from Spain, and kept his position until his death.

Labia'tæ, a natural order of dicotyledonous herbs or sub-shrubs distributed mainly in temperate climates. The species, of which there are more than 2,500, grouped in about 150 genera, are characterized by four-cornered stems; opposite, exstipulate leaves; two-lipped flowers generally in whorls, cymes or heads; and one to four achenes in a persistent calyx. They are noted for their volatile oils, which in many instances are of economic importance either as perfumes, or as flavorings. Some species are cultivated for ornament, but probably the best known are those which have been used for centuries for flavoring food, such as sage, thyme, savory, marjoram, mint, balm, and basil (qq.v.). The species used most frequently in perfumery are probably lavender, rosemary and patchouli. One species variously known as Chinese and Japanese artichoke, chorogi, and knotroot. *Stachys sieboldi* or *S. affinis* yields edible tubers which are eaten raw or cooked in Asia, France and to a small extent in the United States. Many labiates have at some time been reputed medicinal but are now rarely used except to disguise the taste of disagreeably flavored drugs. The best known genera represented in the United States are: *Nepeta* (catnip), *Mentha* (mint), *Origanum* (marjoram), *Salvia* (sage), *Thymus* (thyme), *Marrubium* (horehound), *Satureia* (savory), *Lavandula* (lavender), *Monarda* (horsemint), *Ocimum* (basil), *Melissa* (balm), *Scutellaria* (skullcap), *Lamium* (dead nettle), *Calamintha* (calaminth), *Teucrium* (germander), and *Trichostema* (blue curls).

Labiche, Eugène Marin, ė-zhān mä-răṅ lă-bēsh, French dramatist: b. Paris 5 May 1815; d. there 13 Jan. 1888. He wrote, chiefly in collaboration with other authors, upward of 100 plays, many of them very successful. They are mostly distinguished by extravagant plots, and are full of droll situations. In 1880 he was elected to the Academy, and after that date ceased to write for the stage. His dramatic works were collected in 10 volumes (1878–9). Among the best of them may be mentioned: 'The Italian Straw Hat' (1857); 'Le Voyage de M. Perrichon' (1860); 'Moi' (1864). Consult: Matthews, 'French Dramatists' (1901).

Lablache, Luigi, loo-ē'jē lä-bläsh', operatic singer: b. Naples, Italy, 6 Dec. 1794; d. there 23 Jan. 1858. He studied at the local Conservatory della Pietá de Turchini under the guidance of Valesis, and made his début as a bass singer, *buffo Napoletano,* in Fioravanti's 'Molinara.' Later he enlarged his repertoire by singing in grand opera, and appeared as Mercadente in 'Elisa and Claudio.' His reputation soon extended over Italy. In his 20th year, when the triumph of Rossini was at its height, he stood forth as the greatest interpreter of that master, and reached the summit of his fame. A medal was struck off in his honor at Vienna in 1825. For the next 17 years he annually appeared in Italian opera in London, Paris, and St. Petersburg. He was equally admirable in comic and serious operas, and the school of music which he opened in Paris had considerable success in handing on the traditions of his style.

Labor. See AMERICAN LABOR.

Labor, American Federation of. See AMERICAN FEDERATION OF LABOR.

Labor and Commerce, Department of. See COMMERCE.

Labor Bureau, more properly the bureau of labor, a sub-department of the Department of Labor and Commerce. Originally the Bureau of Labor was a part of the Interior Department, but at the creation of the new department by the Congress 11 Feb. 1903, the bureau was transferred. It was organized in 1885, and Carroll D. Wright, who had been very successful as chief of the Bureau of Statistics in Massachusetts, was appointed Commissioner of Labor. At the end of three years Commissioner Wright had made such signal success in the new department that the bureau was changed to the Department of Labor, with independent functions. It has issued annual reports, special reports and bi-monthly bulletins of great educational value.

Nearly every State in the Union also has a labor bureau, or department of labor, the oldest being that of Massachusetts, organized in 1869. Several of the State bureaus, particularly those of New York and Connecticut, maintain free employment agencies. The Federal and State bureaus had published up to October 1903 only 500 volumes on labor topics. These State bureaus have been kept remarkably free from partisan politics, and those have been decidedly successful in the settling of labor disputes and in preventing strikes and lockouts. These organizations proved so successful that European nations soon followed the American example. In 1891 France organized a bureau of labor and in 1892 Germany followed with a labor commission. In 1893 a labor department under the direction of a Commission for Labor was instituted in England. Austra, Italy, Sweden, New Zealand, New South Wales and Canada have since established similar bureaus. Consult: Wright, 'The Workings of the Department of Labor,' and 'The Value and Influence of Labor Statistics,' in 'Monographs on Social Economics' (Washington 1901).

Labor Colonies, or agricultural communities, are common in Europe but almost unknown in the United States. They are maintained for the purpose of giving employment and training to individuals who, on account of misfortune or inefficiency, find it difficult to earn a living. In Holland there are four of these labor colonies, at Wilhelmsoord, Frederiksoord, Wilhelminasoord and Colony No. 7, which have been established for over half a century. They occupy 5,000 acres of land and have a membership of over 2,000. At La Chalmelle, France, is a colony established in 1892. It occupies 318 acres of land and has 300 colonists. In Germany there are 26 colonies all established since 1882. New Zealand has a government farm of 1,000 acres. In Belgium are two colonies which are practically penal institutions for vagrants and beggars. There are several colonies in England, and in the United States three small colonies have been established by the Salvation Army, one each in Colorado, California and Ohio. The most successful is the Colorado colony which has 150 members. The colony system in all the European countries is practically communism under government control, all the colonies being conducted on the co-operative plan.

Labor Congress, an assemblage, either national or international, of representatives of organized labor. In 1866 the first International Labor Congress was held at Geneva, Switzerland, about 60 delegates being present from England, France, Germany, Holland and Switzerland. The results of this meeting were the condemnation of the industrial employment of women, the advocating of technical education and the organization of mutual credit associations. At the congress of 1869, held at Basel, Switzerland, labor representatives were in attendance from Russia, Austria, Germany, France, England, Spain, Italy, and Switzerland. This assembly by a vote of 54 to 4 declared that landed property should be abolished. Other similar congresses were held at Dresden, 1871; The Hague, 1872; Paris, 1886; Berlin, 1891, and Zürich, 1897.

An International Socialist-Labor Congress was held in Paris in 1889. In 1891 a second Socialist-Labor congress was held at Brussels, at which 400 delegates were present from nearly every country in the world, including Canada and the United States. Among the topics discussed were: the eight-hour day, militarism, universal suffrage, and legislative protection of labor. At the congress of 1893 at Zürich, Switzerland, 385 delegates were present, and admission was denied to all avowed anarchists. The congress, now assuming definite organization, met in London in 1896, and arranged to meet every four years thereafter. The anarchists were again denied admission, and resolutions were adopted opposing standing armies, advocating the nationalization of land and the socialization of industry.

The next meeting of the International Socialist-Labor Congress was held in Paris, in 1900, when the assembly discussed the laws regulating strikes and boycotts and favored the abolition of the capitalistic class. Resolutions were passed favoring a fixed minimum wage and the nationalization of mines. The congress for 1901 held 14 Sept. at Amsterdam, discussed the following questions: General strikes; general rules of political socialism; trades unionism and politics; colonial politics; international arbitration; the relation of the trust question to the unemployed problem; emigration. Of this organization which meets every four years there is a standing committee known as the International Socialist Bureau, which meets annually. The meeting for 1903 was held in Berlin.

Various national labor congresses are held in several countries, particularly in England, where an annual convention has been held since 1868. Congresses of anarchists convening under the disguise of labor have been held at intervals in Lyons, Havre, Brussels, Barcelona and other cities. See also LABOR UNIONS; SOCIALISM.

Labor, Court of (Industrial Department of the National Civic Federation). At a conference of representatives of capital and labor, held in New York 17 Dec. 1901, under the auspices of the National Civic Federation (q.v.), a permanent board was appointed to settle differences between the employees and the labor unions. On this board were 12 representatives of organized labor, 12 representative employers and 12 leading educators, clergymen and public men. On 18 Dec. 1901 the committee organized on a permanent basis, with Senator M. A. Hanna as chairman, and Oscar S. Straus and Samuel Gompers, vice-chairmen. The following statement was issued, indicative of the purposes of the committee:

«This committee shall be known as the industrial department of the National Civic Federation. The scope and province of this department shall be to do what may seem best to promote industrial peace; to be helpful in establishing rightful relations between employers and workers; by its good offices to endeavor to obviate and prevent strikes and lockouts; to aid in renewing industrial relations where a rupture has occurred. That at all times representatives of employers and workers, organized or unorganized, should confer for the adjustment of differences or disputes before an acute stage is reached, and thus avoid or minimize the number of strikes or lockouts. That mutual agreements as to conditions under which labor shall be performed should be encouraged, and that when agreements are made the terms thereof should be faithfully adhered to, both in letter and spirit, by both parties. This department, either as a whole, or a sub-committee by it appointed, shall, when requested, act as a forum to adjust and decide upon questions at issue between workers and their employers, provided in its opinion the subject is one of sufficient importance. This department will not consider abstract industrial problems. This department assumes no power of arbitration unless such powers be conferred by both parties to a dispute. This department shall adopt a set of by-laws for its government.»

The committee since its organization has been instrumental in settling numerous troubles and disputes between capital and labor. See NATIONAL CIVIC FEDERATION.

Labor Day, in the United States, the first Monday in September, a legal holiday in all the States and Territories except Nevada, North Dakota, and Wyoming. In Louisiana it is observed only in the parish of New Orleans. The celebration of this day was inaugurated by the Knights of Labor, who in 1882 held a parade in New York, and again in 1884, when resolutions were passed to hold all parades on that day. Workingmen of all organizations then began agitation to have the day made a legal holiday, and in 1887 the first law to that effect was passed in Colorado. The day is celebrated by parades and by meetings addressed by prominent labor leaders. In Europe the celebration of the first of May as Labor Day was begun in 1890 with a demonstration in favor of the eight-hour day; it was at that time and for a few years later much feared and violently opposed by the various governments, and there were many clashes between the police and soldiers and the workingmen. It is now usually celebrated without trouble. In the United States, May Day is celebrated by the Socialist-Labor party, but there is no attempt to cease work on that day.

Labor Exchanges, a name erroneously applied to employment bureaus (q.v.). It was also a term given to a class of institutions founded by the followers of Robert Owen (q.v.) in 1832–5. These were designed to bring about an exchange of products of labor without the intervention of money. Many stores were founded but the plan was soon found impracticable.

Labor Legislation in the United States. The problem of protecting the laboring classes against the employing class is of relatively late development in the United States, owing to the superior prosperity of the laborers, the rapid increase in employments and competition for workmen. Of course, direct United States laws on the subject cannot exist, all such legislation being reserved to the States; the most the government can do is to set an example of short hours, high wages, and sanitary conditions in its own workshops or other employments, and make enactments for the District of Columbia. State legislation is too scattered and discordant to present in full; only a classification of the subjects of legislation will be attempted.

The Contract in General.— One of the fundamental principals of the common law, though not expressed in statutes, is that long contracts for personal service, which might end in a form of serfdom, will not be enforced beyond two years; in one State nothing beyond one year is enforceable; which implies that under these limits it could be, but no case has yet arisen. The notice to be given on quitting employment has been regulated in several States by an enactment that an employer shall give an employee the same notice which he exacts by withholding wages, requiring bonds, etc.

Rate, Form, Period, etc., of Wages.—There is no statute in any State fixing the rate of wages, nor would it be constitutional, in all probability. The nearest approach is an Indiana statute of 1899 providing a minimum of 15 cents an hour for manual labor. It is often provided in municipal orders, however, that work on contracts shall not be paid at less than current local rates. The wage-paying period has in some cases been legally fixed as weekly; it is not certain that this is either constitutional or wise. More common and of much less doubtful utility are the laws in some States forbidding the payment of wages in orders for goods, or anything but cash, and prohibiting companies from operating or being interested in stores or supply establishments, Maryland and Illinois have this in action; the Pennsylvania statute was held unconstitutional. Laws regulating fines and deductions, weighing, etc., have been enacted, and «screen laws» for the coal mines.

Hours of Labor.—This has been and is one of the most persistently fought of labor questions, but for adult work it has not been very successful thus far on the State-arena, the only statute establishing a general 8-hour law with enforced payment for overtime — that of Nebraska — having been declared unconstitutional. Wyoming by constitution, however, and Missouri and Utah by statute, have established an 8-hour day for the mines; and it is usual to fix 8 hours as a day's work where the contract does not specify any. This is also becoming customary in public work for States and cities, and will doubtless become universal. The State also claims the right to regulate hours in unsanitary or dangerous occupations. On the subject of children's labor, the Northern States east of the Rockies have generally a full and systematic body of legislation; efforts are making by the best citizens of the South to have its States adopt similar laws. These statutes restrict the labor of children under certain years (10 at lowest, more commonly 12 or 14) to a usual 10 hours a day, and 55 to 58 hours a week; 12 hours in Pennsylvania, but even there only 60 hours a week. It is also usual to order the hours arranged so as not to interfere with school hours, unless the children have reached a certain standard. Some States make these laws apply to adult women as well; some prohibit women's labor in the mines altogether.

Personal Liberty.—A number of enactments have been made to prevent intimidation of workmen by threats of loss of employment, etc.; and by pay envelopes or placards in work-rooms drawing menacing pictures of shutting down, discharging men, etc., if certain political results ensue. Forbidding men to join unions, forcing them to contribute to benefit societies, or to employ a company physician, etc., are legislated against.

«*Government by Injunction*» (q.v.).—The use of injunctions and proceedings for contempt to suppress labor riots has greatly incensed the workingmen, and in Kansas a statute has been passed which goes so far as practically to make it impossible to enforce any contract that does not sound in damages.

Health, Safety, Moral Conditions, etc.— The evils of the sweat-shop — tenement manufactures, mainly confined to clothing — have drawn out legislation, either extending the factory acts to them, or restricting the manufacture to members of the resident family and requiring a license. In factories, there are laws providing a given air space for each hand, and machine appliances for removing dust, guards for belts, shafts, dangerous machinery, elevators, etc., prohibition of cleaning machinery while in motion, sometimes of women or children cleaning it at all, fire escapes, etc. See FACTORIES AND FACTORY INSPECTION.

Employers' Liability.— This branch of law in America is almost entirely the creation of the past 20 years; so much so that a great and flourishing branch of accident insurance, unknown a generation ago, now takes in many millions of dollars in premiums annually. The employer has always been liable in damages to an employee for accident resulting from his own negligence, or defects in his plant, as from breaking machinery, bad floors, etc.; but not from the negligence of fellow employees. The latter has of late years been changed, so that the employer is now liable for all accidents in his service except where the employee's own negligence is the cause; and the large liability superinduced makes it needful to insure the hazard.

Labor, Organized. See UNIONISM.

Labor Union, The American, a Socialist-Labor organization founded in May 1898, as the Western Labor Union. At a convention held in Denver, Colo., in 1902, the scope of the organization was widened and the name changed. It favors international socialism, and the government of the body is more centralized than ordinary federations of trade unions. The Union is composed largely of trade unions in the States of Colorado, Idaho, Montana, Washington, and Wyoming. In 1903 it had 173 local unions, 5 district unions, and a membership of 150,000. The official organ is the ‹American Labor Union Journal,› published at Butte, Mont.

Labor Unions. See UNIONISM.

Laboratory (from the mediæval Latin *laboratorium*, meaning workshop). The word is used to denote any room or building devoted to experimental investigations in technics and the sciences, or to the teaching of scientific and technical knowledge by means of experiments. The term is used to denote the work-room of a manufacturing chemist, or to the testing-rooms of an industry. In early times laboratories were used by the priesthood, who tried to throw a mantle of secrecy about them. Chemical operations were carried on in them and drugs and potions were made in them. Out of these early laboratories grew those of the Middle Ages. In this later period they were devoted to astrology, the making of drugs, potions and charms and to the search for the philosopher's stone by means of which it might be possible to change the baser metals into gold. Some of these laboratories were very important in their day, having the nobility for patrons, or being maintained at the public expense.

In 1683, a laboratory for academic instruction was opened at the University of Altdorf. Many private laboratories were established about this time, but their rapid development for instruction and research did not begin until the 19th century.

Among the first laboratories established, open to students, were those of Purkinje, who established a physiological laboratory at

Breslau in 1825; and the chemical laboratory established through the efforts of Baron von Liebig at the University of Giessen in the same year. The first physical laboratories for students were founded about 1846; one at Heidelberg, by Philipp Gustav Jolly; and one at the University of Glasgow by William Thomson — now Lord Kelvin.

The introduction of the laboratory into the educational system of the United States was made by the Rensselaer Polytechnic Institute, which established a chemical laboratory at about the same time as that established at the University of Giessen; and by the Massachusetts Institute of Technology, which also established a chemical laboratory. The movement for the establishment of laboratories in the United States was independent of that in Europe.

Among the great laboratories of the world may be noted that of the Royal Institution, established in 1800 by Count Rumford, which was to be devoted to the applied sciences, but which soon became the seat of great activity in researches in pure science, conducted by such men as Davy, Faraday, and Tyndall. The Physikalische Reichsanstalt, in Charlottenburg, near Berlin, is a very famous laboratory where there are departments devoted to research in pure science, and other departments for the study of the applications of science to industrial pursuits. In 1875 a Committee of Weights and Measures, made up of representatives of 18 nations, was organized for the purpose of reproducing and furnishing international metric standards to the members. A laboratory for their manufacture and for research was established near Paris. Great Britain has placed the control of a recently founded national laboratory, where standards of weights and measures are to be kept, duplicates made, instruments tested, and research is to be carried on, with the Royal Society. In the United States the Smithsonian Institution (q.v.) was established in 1846. Many important lines of research have been developed there, out of some of which have grown up some governmental departments; as the United States Weather Bureau and the United States Fish Commission. The United States government has established, by act of Congress, approved 3 March 1901, a National Bureau of Standards, a suitable building and equipment also being provided for. The bureau has the custody of the standards of weights and measures, and has power to manufacture duplicates, multiples and submultiples. It also has the power to officially test and calibrate physical and chemical apparatus and issue certificates for them. Research is to be carried on, when of great importance to commercial and scientific interests.

Laboratories for studying science by means of experiment, and for research, have been established in practically all American institutions of learning. In many preparatory schools and in an ever-increasing number of high schools, elementary laboratories are added for the study of physics, chemistry, and biology.

Laboratories for research and for testing form a part of many industrial enterprises, as in the manufacture of steel. The material is tested chemically at different stages of the process in order to determine the treatment in a subsequent process. Physical tests are made of its strength and density. Investigations are carried out with respect to the effect of different processes of manufacture on its physical characteristics. Another example is the laboratory of the manufacturing chemist, where he tests his product and seeks for new, better and cheaper processes of manufacture.

Many industries of to-day are based on processes devised and worked out in laboratories for research. Some examples are the great plants at Niagara Falls, where metallic aluminium, calcium carbide, sodium hydrate and many other compounds are made. The basis of the progress in applied electricity is research in physics and chemistry. In many lines of industry scientific research in public and private laboratories has made possible new and better processes. In those countries where there is the greatest activity in research in science and its applications there is also the greatest industrial activity.

Research in the biological sciences has helped to a better understanding of life and to its prolongation. The causes of many infectious and contagious diseases have been discovered, and effective methods of prevention and of combating them have been found. The Pasteur institutes in many large cities all over the world are witnesses to these facts.

A general outline and some of the details of construction, equipment, and uses of a few of the most common types of laboratories found in educational institutions of the present day are given below. Many laboratories where excellent work is being done are very much simpler than those described; and, on the other hand, some are much more elaborate in construction and equipment. Some features are common to them all, one of which is the lecture room, where experimental demonstrations are given before many students at one time.

Biological Laboratory.— It is necessary in the present instance to dwell but briefly on any particular subdivision of laboratories devoted to the study of biology. Biological laboratories in Europe were established during the early part of the last half of the 19th century. Louis Agassiz led the movement in the United States in the establishment of biological laboratories, by establishing a zoological laboratory at Harvard.

Agassiz also developed the modern marine laboratory which has led to the establishment of many such laboratories in all parts of the world. The researches in these laboratories have been of greatest value in the biological sciences. Among the marine laboratories of the world must be enumerated the great laboratory established in 1872 by Dr. Anton Dohrn at Naples. Specialists from all parts of the world go to this laboratory to do research work. The United States Fish Commission has established two very important marine laboratories in the United States: one at Woods Holl, Mass., the other at Beaufort, N. C., in 1899. Woods Holl was the centre of activity in 1871 and again in 1875. The first building of the present fish culture and experiment station was completed in 1884. This laboratory has been open to voluntary investigators, tables being assigned to them. The investigators have numbered among them men from the principal universities of the country, and much valuable work both of economic and scientific value has been done there. The marine laboratory established at Beaufort, N. C., promises to be one of the greatest, if not the greatest, biological station in the world; larger than the one at Woods Holl or the one at Naples on the Mediterranean.

A second very important marine biological laboratory for research exists at Woods Holl, where scientists from many institutions congregate. This laboratory is devoted entirely to research. There are many other important biological stations along the Atlantic, Pacific, and Gulf coasts and a few on the Great Lakes.

The special appliances necessary to meet the needs of marine laboratories, are boats, both large and small, nets, apparatus for obtaining the vegetable as well as the animal life of the salt and fresh water bodies, and aquariums.

The epoch-making researches of Pasteur in France on bacteria have led to the establishment of important bacteriological laboratories throughout the world. The universities and colleges in the United States have many laboratories devoted to teaching and investigation along the different groups of the biological sciences.

The botanical laboratory is devoted to the study of the life of plants, and their classification according to their distinguishing characteristics and structure.

The laboratories for the whole group of biological sciences have much equipment in common. The laboratory rooms should be well lighted, preferably with north light and with window bars done away with as much as possible; the building should be situated so as to have a low horizon. This is important in microscopic and microphotographic work, in order to get a uniform lighting of the slide on the microscope stage. The rooms should be provided with tables, on which is placed a full equipment of reagents, staining and preserving solutions. Dissecting instruments are among the individual needs of the students. The microscopes for the more advanced work should have three objectives, one of comparatively low power, another of higher power, and the third an immersion objective. Microtomes are needed for cutting sections, to be mounted on slides for examination under the microscope. The photomicrographic camera aids very materially in the careful, systematic study of specimens. The negatives thus obtained are available for making lantern slides for projection purposes and for making enlarged photographs. In some lines of research work, as in bacteriology, culture media, in which the particular form of life may grow and multiply, may be used. Often the cultures must be kept for hours at a certain temperature, thus necessitating incubators, of which the temperature is regulated by thermostats. Frequently rooms are set apart for cultures. Dark rooms are essential for the development of negatives resulting from the photographic work.

Chemical Laboratory.— The chemical laboratory is one of the most important factors in the educational and industrial systems of our civilization. The rooms of the chemical laboratory should be well lighted and ventilated. Special lines of work should be isolated. The lecture room for demonstration purposes should be much the same in its general features as the physical lecture room (q.v.). The lecture room should be supplied with different gases, including common illuminating gas, oxygen, and hydrogen. The oxygen and hydrogen are generally supplied in heavy steel tanks under high pressure. A demonstration lantern should be conveniently placed. The table top should have one or two holes in it connected to the suction fan for carrying off fumes and gases, thus keeping them from being disseminated through the room.

The inorganic laboratories, for elementary purposes, may be divided into three principal divisions: first, that devoted to the study of the simple reactions by the beginner, who there learns experimentally what takes place in the simple reactions, as that of the production of hydrogen gas by pouring sulphuric acid on zinc, forming zinc sulphate and liberating the gas. The second division is that part devoted to qualitative analysis, where more complex reactions are studied and where the student learns to recognize and to test for the presence of the different elements. Under the third division is found quantitative analysis, which, as the name implies, is devoted to the study of the quantitative relations of compounds.

The work in these three divisions leads up to the more complex work of organic chemistry and research work. The equipment of these laboratories will give a general outline of the whole. Wide top tables should be provided. The tops should be impervious to water and as little acted on by acids as possible. Alberene stone is excellent material for such purposes. A good construction is to have the tops slope a little from both sides to the centre line, where a trough is placed to carry off the wastes to the sewer. Racks for the storing of bottles containing reagents should be placed so as to be easily reached by the students from both sides of the table. Beneath the top should be drawers and shelving so subdivided that each student may keep his apparatus separate. The tables should be provided with gas and water, with plenty of taps, and with electrical connections. Means should also be furnished for boiling under reduced pressure. For the experiments where noxious gases are given off, hoods should be provided, the bases being of the same material as the table tops, the sides and top of fixed glass with a glass window that may be opened in front. For ventilation within the hood there should be openings to a flue connected with a blower which produces a suction of the gases from the hood. One of the openings should be well toward the top and the other at the bottom of the hood. If artificial lighting is required it should be from above the glass top. Plenty of stop-cocks for gas, water, and suction should be provided for each hood.

Among the independent rooms needed, are those for the following purposes: A hydrogen sulphide plant is an absolute necessity, and it should be isolated to the extent of having a well ventilated room of its own. It should, however, be situated as conveniently as possible to the main divisions of the laboratory. Sometimes it may be advantageous to pipe the gas to different rooms. Near the quantitative laboratory should be a balance room well stocked with analytical balances supported on solid tables or wall brackets. A combustion room and a furnace room are often required. The furnace room should be so located as to get a good draft or so as to be connected to a suction fan system. Dark rooms for photography and spectroscopy should have a dead black finish, and those for photography should be supplied with means for obtaining ruby light.

The study of the spectrum of gases makes it necessary to have a good induction coil to produce a spark spectrum, which may be viewed by the eye, or which may be photographed. The range of temperatures at which chemical phenomena are now studied calls for very high and very low temperatures, which means that the electric furnace and a liquid air plant are often desirable. Apparatus for distillation under different pressures, and for obtaining constant temperatures are very necessary in some phases of the work. The rooms for gas analysis should be so situated as to make it possible to have but small temperature fluctuations. A north exposure, thus getting rid of direct sunlight and yet getting good illumination, is preferable. The principal part of the equipment needed for gas analysis by the Hempel method includes gas buretts, to measure volumes, absorption pipettes for the different reagents used to absorb different gases, combustion pipettes and oxygen generators.

The physical chemistry laboratory requires much apparatus and equipment needed in physics and in the other divisions of chemical work, including analytical balances, thermometers, barometers, manometers, calorimeters, thermostats, motors, stirring gear, refractometers, spectrometers, apparatus for studying polarized light, ammeters, voltmeters, resistances, and many other pieces. Among the subjects studied in the student laboratory are density, viscosity, vapor pressure, boiling and freezing points, heats of fusion and vaporization, critical temperatures, pressures and volumes, heats of combustion, solubility and the various divisions of electrolysis and electro-chemistry.

Electrical Laboratory.— The student and investigator in the field of electricity should have a thorough grounding in general physics and physical laboratory methods. The student in the electrical laboratory becomes acquainted with the relations of electric currents, electromotive forces and resistances; and the production and transmission of electrical energy, electrical quantity, capacity, magnetism and the relations between electricity and magnetism. The laboratory should be of strong construction on account of the lines of shafting and the heavy machines used. In the general laboratory will be found for purposes of investigation: dynamos of the various direct and alternating current types; direct and alternating current motors, the latter covering synchronous, two-phase and three-phase motors, induction motors, and rotary converters. Portable and variable inductive and non-inductive resistances; portable and fixed instruments for measuring current, electrical pressure or potential and power should be plentifully supplied. The fixed machines, instruments, the private rooms and tables should have lines of wire connecting them with a central switchboard through which any desired grouping of stations may be made. Among the separate departments may be one for testing and studying transformers; one for investigating the magnetic properties of iron, steel and other metals; a potentiometer room in which to test and calibrate the instruments used in electrical measurements. Some interesting and important parts of the work are the investigation of the resistance and strength of insulators and conductors; the study of condensers and their effect in a circuit; the study of self and mutual induction and the measurements of them. Separate rooms which can be made dark, the walls of which absorb as much light as possible, or which can be made any color desired by a proper arrangement of coverings, where work in lighting and photometry may be performed, are also important parts of the equipment of an electrical laboratory.

The electrical engineering student should find it possible to make tests in all lines of his profession, approximating, as nearly as possible, actual working conditions in the commercial world. In order to give the greatest usefulness to the laboratory, the equipment should be kept abreast with the advances in the best engineering practice.

Engineering Laboratory.— Engineering laboratories have been developed within the past forty years along all lines of engineering and technical education. The divisions are many, but only a few of them will be considered here. The electrical engineering laboratory has been discussed above under the head of *Electrical Laboratory*. Under the division of Mechanical Engineering may be placed railroad engineering, marine engineering and the like. Among the subdivisions under Civil Engineering are mining engineering, hydraulic engineering, sanitary engineering and bridge engineering, for all of which laboratories have been developed.

The mechanical laboratory, as its name implies, treats of mechanics, the sources of mechanical energy and its transmission. The laboratory should be a solid structure with massive foundations for the heavy machines used. Boiler rooms, engine rooms, material testing rooms, and general experimental rooms on mechanical devices, are the requisites. The boilers tested comprise fire-tube, water-tube, and shell boilers. Tests are made of fuels, as to their steaming qualities, the ash, and flue gases, by means of calorimeters, gas meters, thermometers, thermo-elements, and balances. Engine tests may be made on many steam motors comprising steam turbines, simple slide valve, Corliss, and compound engines of high and low pressure types. For these tests are needed steam gauges, thermometers, indicators communicating directly with the inside of the cylinders, together with «reducing motions» for obtaining automatic records of the steam pressure within the cylinders during a complete stroke, from which data may be obtained by means of which to compute the energy put into the engine; and dynamometers to measure the output in useful work.

Another department is devoted to internal combustion motors. Under this class are included hot air engines, oil and gas engines, which require dynamometers, gas meters, and other measurers of the fuel supplied, and means for testing the products of combustion. In the mechanical laboratory, water motors, fans, blowers, air compressors, compressed air machines and tools, different methods of power transmission, as by shafting, gearing, belts, ropes and chains, and the like, are studied. Measurements of the coefficients of friction of different substances are found, and the effects of lubrication by different substances are investigated. Lubricants are tested under various conditions, such as at various temperatures, pressures, and in the presence of different vapors or gases. The testing of materials is common to mechanical and civil engineering laboratories. It will be outlined under the latter head.

In the civil engineering laboratories, calculating and measuring instruments are tested and calibrated. Among these instruments are transits and levels, and all instruments having graduated circles, cross-hairs and spirit levels; steel tapes; chains and bars for measuring lengths; chronometers for measuring time; barometers and thermometers. Here also is studied the magnetometer; and by means of it the strength of the horizontal component of the earth's magnetic field. The variation and dip of the earth field are also investigated. The «acceleration of gravity» is determined.

In the hydraulic division of these laboratories are studied the flow of water in pipes, «skin friction,» the flow of water through different orifices under different conditions, the flow of water over weirs and its measurement. This is very important in irrigation.

The laboratory devoted to the testing of materials is a very important one in all engineering work. All kinds of materials used in engineering work are tested. The apparatus required comprises machines for testing the resistance to compression, of tensile strength, of torsion and flexure of materials. Cements are tested for their resistance to tension and compression and for the length of time required for them to set. For the last test named, automatic apparatus has been devised which registers time and amount of «set.» Forms in which to mold the briquettes, and water tanks in which to immerse them for setting, are among the required equipment. Tests on concretes are made in a similar manner. Abrasion machines are used to make tests on paving material and other material subject to wear.

Physical Laboratory.— The requirements of the modern physical laboratory depend greatly upon the work to be done, but a few of the chief requisites that are common to all may be noted. The housing and equipment of a physical laboratory is of very great importance. The building in which the laboratory is to be located should be so situated as to reduce to a minimum all jar and tremor, and to do away with all outside magnetic disturbances, such as those due to electric car lines.

Many rooms are needed for special divisions of the work; such as constant temperature rooms, which require special precautions in design and construction and which are best situated below ground. Special rooms are demanded for radiometers, spectrometers, potentiometers, and such other instruments as require constant conditions to insure good results. Dark rooms are necessary for work in light, which includes experiments requiring diffraction gratings, photometers and the phenomena of light in general. Since photography has become of very great practical importance, fully equipped dark rooms are desired; also a sky-light room where enlargements and reductions of negatives may be made, and lantern slides prepared. It should be possible to introduce sunlight into some of the rooms.

A lecture room in which experimental demonstrations may be given is a necessity, and much attention should be given to its arrangement. The lecture room should be well lighted but should be provided with arrangements for readily darkening it. The experimental lecture table should be placed so as to be easily seen from all parts of the room. This table should have water, gas, air blast, suction, water motors and other motors, sink, and terminals for obtaining direct and alternating currents. A solid masonry pier upon which to set up delicate apparatus and that requiring no vibration, should be provided. The table tops should be impervious to water and so far as possible acid-resisting.

An apparatus room in which is kept demonstration apparatus should be situated conveniently to the lecture room; general apparatus may also be kept there. The opening between the apparatus room and the lecture room should be large enough to admit the passage of large pieces of apparatus, and also to allow experiments to be set up on wheeled tables in the apparatus room, then wheeled directly into the lecture room.

Separate rooms should be provided for research work. It is desirable that it be possible to connect some of the rooms in suites, and to provide dark rooms for some of the suites.

Research rooms should contain water and gas, both ordinary illuminating and acetylene gas. They should have electrical connections to a central switchboard sufficient to obtain various types of current at one time. The floors of the building should be solid. Stone tables built in the walls form good supports for instruments, but there should be provided in some cases stone piers with independent foundations.

The general laboratories should have plenty of light and should be provided with separate rooms for some classes of work, as in light and sound, where it is often necessary to have darkened rooms. A heat bench or table should be provided; it should have an impervious top with enough pitch to drain into a central trough or hole to conduct away the waste. A rack with hooks above the bench, from which to suspend thermometers, is convenient. The rooms should be well supplied with tables, and along the walls stone shelving built in the walls, will be found useful. The dirt incident to primary batteries may be concentrated if all the cells be kept together, their terminals leading to a switchboard to which are connected the terminals of lines leading to the various stations in the rooms.

Some of the apparatus needed may be noted: projection lanterns for demonstration purposes; pulleys; weights; pendulums; machines for studying the acceleration of bodies; balances of different capacity and sensitiveness; vacuum pumps; pressure pumps; apparatus for comparing densities of substances; apparatus for testing the gas laws; calorimeters; thermometers; hydrometers; dividing engines; chronometers; chronographs; standard tuning-forks, some electrically driven; resonators; sirens; lenses; mirrors; prisms; spectrometers; radiometers; photometers; permanent and electromagnets; electroscopes; electrometers; many types of galvanometers, some for the measurement of electrical differences of potential or pressure, some for measuring current, and others for measuring quantity; ammeters; voltmeters; wattmeters;

bridges, for measuring resistances; condensers; Leyden jars; electric machines; potentiometers; and a plentiful supply of standard cells and resistance boxes.

The laboratory should also have storage batteries, and, if necessary, have its own dynamos in order to procure direct and alternating currents. An acetylene gas plant, and a compressor and liquefier for obtaining liquid air and other gases, are becoming necessary parts of the general equipment of a Physical Laboratory. A plant for the production of oxygen and hydrogen is also often desirable. A workshop in which to repair and build apparatus is a great convenience. The wiring and plumbing should be open and accessible as possible. All dark rooms as well as other rooms should be well ventilated, as it is often imperative for an observer to be confined in a room for hours at a time. Further reference to physical laboratory equipment will be found under the head of *Electrical Laboratory*.

Psychological Laboratory.— Since the establishment of the first psychological laboratory in Leipsic in 1875, by Wilhelm Wundt, where one room was devoted to apparatus and research, the development of the psychological laboratory has been rapid. One of Wundt's first students, G. Stanley Hall, established the first psychological laboratory in America at Johns Hopkins University in 1881.

The requirements of the psychological laboratory have increased very rapidly with the development of the subject, until its housing and equipment has become a problem of great importance and interest. Many rooms and much equipment are now required for a detailed study of the various subdivisions of the subject. Beside the rooms necessary in teaching psychology by means of experiments, other rooms for research are needed. Quiet and relaxation being often necessary, it is important to so arrange the rooms that the work of one student will in no way interfere with that of another student. The separate rooms should be provided with gas, electric lights, and water. Where absolute quiet is required, piping of all kinds should be excluded, the heating being done by indirect radiation if necessary, and only incandescent electric lighting being used. The rooms should be wired for electrical inter-communication between those which may likely be desired to be used in suites. They should also have wires leading to the rooms where chronometers and electrical recording devices are located.

For the study of the sensations of light and the eye, its capacity and limitations, suites of rooms are desirable in many instances. These rooms should be capable of being either well lighted or darkened to any desired degree. The equipment of this part of the laboratory includes models of the eye and the muscles governing its movements, sectional models; apparatus for studying color sensations, color mixing, color blindness, contrast, brightness independent of the color sensation; apparatus for studying optical illusions, the sensitiveness of the retina at different points, the sensitiveness of the eye to changes in position, the sense of location, and the imperfections of the eye; and apparatus for studying reactions and reaction times.

The sensation of sound requires isolated rooms where the noises produced may not reach other parts of the laboratory; and for certain parts of the work, rooms that are sound and light proof. In this part of the laboratory the sensitiveness, range, and analyzing power of the ear are studied. The equipment for the work in sound comprises models of the ear; instruments for producing sound, such as tuning-forks, sirens, organ pipes, and other sources of vibrations; and resonators for analyzing complex sounds.

Other rooms are needed for studying the sense of heat and cold, pressure, pain, and the locations of the various end organs. The apparatus necessary is that required to produce the corresponding sensations. The effects of different sensations on the respiratory organs and heart action is another subject for investigation. Other parts of the laboratory are devoted to the senses of taste and smell. The equipment comprises the substances with which to test the various parts of the tongue, and also substances to produce different odors.

Among the special pieces of apparatus necessary may be mentioned the chronometer, the chronograph, electrically driven tuning-forks, sources of mechanical and electrical energy, and induction coils.

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Labori, Fernand Gustave Gaston, fĕr-näṅ güs-täv găs-tôṅ lä-bō-rē, French lawyer and editor: b. Rheims 18 April 1860. He studied at the Rheims Lycée and for two years in Germany and England; took his degrees in the law faculty of Paris in 1881 and 1883, and was enrolled at the bar of the court of appeals in 1884; was secretary of the conference of advocates in 1887-8; took a high professional rank; and was especially prominent as counsel for the defense in notable cases, as the libel action by Compayré against Numa Gilly, and the trials of the anarchists Duval and Vaillant. In 1898 he defended Emile Zola (q.v.), accused of libeling the army and the president of the republic in the letter concerning the Dreyfus case. He was junior counsel to Demange in the defense of Dreyfus at the trial at Rennes in 1899, and thoroughly confuted his opponents by his logic and his brilliant cross-questioning. He did not make the final plea, but his 'Notes de Plaiderie' were published in the 'Compte-rendu Sténographique In-extenso du Procès Dreyfus à Rennes.' On 14 August, while on his way to the court, he was dangerously wounded by a revolver bullet fired by a fanatic or mercenary. He was shortly enabled, however, to continue the case. In 1903 he defended the Humbert swindlers (see HUMBERT SWINDLE, THE). He was editor-in-chief of the judicial daily *La Gazette du Palais* in 1888–94; established the 'Revue du

Palais' and 'Grande Revue' in 1897; and published a 'Repertoire encyclopédique de Droit Français,' in twelve volumes (1898). See Dreyfus, Alfred.

Labouchère, lā-boo-shār', **Henry,** English politician and editor: b. London 1831. He was educated at Eton; was in the British diplomatic service in 1854-64, being at one time a member of the British legation at Washington; in 1865-6 sat in Parliament for Windsor; was then unseated on petition; but represented Middlesex in 1867-8 and Northampton in 1880-1902. During his parliamentary career he strongly advocated Home Rule. He was at one time part proprietor of the London *Daily News,* to which he contributed letters from Paris during the German siege (1870-1) over the signature 'The Besieged Resident.' In 1876 he established and became editor of 'Truth,' a weekly journal in which he has expressed his opinions with great vigor. Indeed, as both parliamentary speaker and journalist, Labouchère gained an important place in English public life through his wit and incisiveness.

Laboulaye, Edouard René Lefebvre, ā-doo-ār rē-nā le-fāvr lā-boo-lā, French publicist and jurist: b. Paris 18 Jan. 1811; d. there 25 May 1883. He studied law and in 1842 he joined the Paris bar. He was a close student of the great German writers on jurisprudence, whose works and researches he introduced to his countrymen in a series of able essays, written in an admirable style. The Academy of Inscriptions and Belles-Lettres crowned his 'Histoire du Droit de Propriété Foncière' (1839), and elected him to its membership in 1845. An 'Essai sur la Vie et les Ouvrages de Savigny' (1840), was followed by 'Recherches sur la Condition civile et politique des Femmes depuis les Romains jusqu'à nos Jours' (1843), and an 'Essai sur les Lois criminelles des Romains concernant la Responsibilité des Magistrats' (1845), both crowned by the Academy of Moral Sciences. In 1849 he was appointed professor of comparative legislation of the Collège de France. After the foundation of the Second Empire he constantly strove to rouse opposition to it, and in several published works as well as in his lectures held up the American constitution to the admiration of his countrymen. He sacrificed his popularity, however, by his support of the plebiscite in 1870, and soon afterward he resigned his chair at the Collège de France. After the fall of the Empire he was elected for Paris in 1871. In 1875 he was elected a life senator. Besides the works abovementioned he wrote: 'Histoire des Etats-Unis d'Amérique' (1854); 'Etudes Contemporaines sur l'Allemagne et les Pays Slaves' (1854); 'Souvenirs d'un Voyageur' (1857); 'Liberté Religieuse' (1858); Etudes sur la Propriété Littéraire en France et en Angleterre' (1858); 'Abdallah' (1859), an Arab romance; 'L'Etat et Ses Limites' (1863); 'Paris en Amérique' (1863), an ingenious and extremely popular satirical romance; 'Contes Bleus' (1863), a series of admirably told tales; 'Nouveaux Contes Bleus' (1866); 'Prince Caniche' (1868), another extremely popular satirical novel; 'Contes et Nouvelles' (1868); 'Discours Populaires' (1869); 'Questions constitutionnelles' (1872); 'Lettres politiques' (1872); 'La Liberté des Enseignements' (1880); and 'Trente Ans d'Enseignement au Collège de France' (1888), a posthumous collection of lectures. He translated into French several of Channing's works and the 'Memoirs and Correspondence of Franklin.'

Labrador, lăb-ra-dôr', a large peninsula at the northeast of the North American continent, lying between Hudson Bay and the Gulf of Saint Lawrence, extending from lat. 49° to 63° N., and from lon. 55° to about 79° W.; greatest length from the Strait of Belle Isle to its most northern cape, Wolstenholme, 1,100 miles; area, 420,000 square miles; pop. about 6,000, collected chiefly at the Moravian missionary stations of Nain, Okkak, Hebron, and Hopedale.

The Atlantic coast is stern and precipitous (1,000 to 4,000 feet high), entirely destitute of vegetation, deeply indented with narrow fiords, and fringed with chains of rocky islands. The inner parts have been but very imperfectly explored; the greater part consists of a plateau, about 2,000 feet above sea-level, and mostly covered with fine forest trees, firs, birches, etc. Numerous lakes, including Mistassini, also exist inland, and, connecting with the rivers, afford in summer continuous waterways for great distances. There are numerous rivers, 200 to 300 miles long and 2 and 3 miles wide at their mouths, flowing toward the Atlantic and Hudson Bay. The Grand Falls on Grand River are believed to be among the largest in the world, and are calculated to be little short of 2,000 feet in height. The rivers abound in fish, especially salmon and whitefish. The principal fur-bearing animals are bears, wolves, foxes, martens, otters, beavers, lynxes, etc., which are trapped by the inhabitants in winter. Of the mineral resources little is known; but iron and labradorite are abundant. The climate on the coast is very rigorous, owing mainly to the ice-laden Arctic current which washes the shores. The short three months' summer is marred by the swarms of mosquitoes and black flies. The mean annual temperature at the missionary stations varies from 22° to 28°. The winter is dry, bracing, and frosty. Since 1809 the coast region has been annexed for administrative purposes to Newfoundland. The remaining parts of the peninsula are designated the Northeast Territory. By far the most important wealth of Labrador is its fish — cod, salmon, herring, and trout. As many as 30,000 fishermen from Newfoundland, Canada, and the United States visit its fishing grounds in the season. The annual catch is valued at more than $5,000,000. The coasts of Labrador were probably visited by the Norsemen about the year 1000; they were again sighted by Cabot in 1498. In 1500 a Portuguese navigator, Cortereal, seems to have visited it and to have given it its name, which means «laborers' land.» Civilized man is found at a few settlements on the Saint Lawrence and Atlantic coasts, and at some widely separated posts of the Hudson's Bay Company. The natives of the northern coast are Esquimos, while some tribes of nomadic Indians are thinly scattered over the interior. The Indians of the interior are all tribes of the once great Algonquin race, and could at one time bring 1,000 warriors to repel the incursions of the Eskimos, whom they still bitterly hate. The Eskimos live almost entirely by fishing. They are mild, hospitable, and honest, and well provided with wolf-like dogs, which can draw them over the snow in sledges at the rate of from 6 to 10 miles an hour. See also Eskimos.

Labrador Duck, a rather small handsome sea-duck (*Camptolaimus labradorius*), allied to the eiders, of the northeastern American coast; it bred in Labrador, and migrated in winter as far south as Chesapeake Bay, but was never very numerous, and became extinct about 1875, leaving only about 35 specimen-skins in the museums of the world. No very satisfactory theory exists to account for the closure of the species, since the fault does not seem chargeable to excessive shooting or disturbance of breeding-places. The race seemed to be waning, and an epidemic of disease or some weather-disaster destroying many eggs and young, may have been a final blow. The last one seems to have been killed in 1875. Consult: Stejneger, Vol. IV. ('Birds') of 'Standard Natural History' (1885); Lucas, 'Ann. Rept. Smithsonian Inst.,' 1888; Dutcher, article in 'The Auk,' January 1894.

Labrador Tea, or **Marsh Tea,** either of two species of heath of the genus *Ledum* (*L. latifolium* and *L. palustre*). They grow in the northern parts of both Europe and America, and are low shrubs with alternate entire leaves clothed underneath with rusty wool. The fragrant crushed leaves are used by the natives of Labrador as a substitute for tea. They possess narcotic properties, render beer heady, and are used in Russia in the manufacture of leather, yielding an oil known to druggists as ledum oil, rich in tannin and resinous properties. The plant finds a place in medicine as an astringent and tonic.

Labradorite, a plagioclase feldspar of the albite-anorthite series, corresponding chiefly to Ab_1An_2 (see FELDSPARS). It is, therefore, a silicate of aluminum, calcium, and sodium. It has a hardness of 5 to 6 and a specific gravity of 2.73. It ordinarily occurs in cleavable or granular masses, or as an essential constituent of certain basic eruptive rocks, such as norite, gabbro, diabase, basalt, dolerite or andesite. In these it is associated with some member of the pyroxene or amphibole groups. Labradorite abounds in the Adirondacks, but its type locality is along the coast of Labrador, where it occurs in pure masses of enormous size which exhibit a wonderful change of colors, from dull gray to a gorgeous blue, or more rarely green, copper-red, purple or yellow. It has been used as an ornamental stone, especially in inlaid work.

Lab'ridæ, a family of marine fishes, the grasses, representing the highly specialized suborder *Pharyngognathi* by a large number of beautiful and useful species inhabiting all the warmer seas, and traceable as far back as the Eocene period. These are brilliantly colored fishes usually elongate in form and of large size, with cycloid scales and thick fleshy lips. There are powerful teeth on the margins of the jaws, but none on the palate; while the united lower pharyngeals are much thickened and form a plate beset with rounded, rarely acuminate grinding-teeth. The upper pharyngeals are usually separate, bearing similar teeth. Jordan enumerates 60 genera and 450 species, «chiefly of the tropical seas, living among rocks or kelp.» The typical genus *Labrus* is almost wholy European. The principal genera represented in American waters are *Ctenolabrus* (cunners), *Tautoga* (tautogs), *Harpe* (lady-fishes), *Pimelometopon* (fatheads), and *Iridio* (doncellas); and by some authors the parrot-fishes (*Scaridæ*) are included. Consult: Jordan's 'Review' of the family in 'Report U. S. Fish Commission for 1887.'

La Bruyère, Jean de, zhŏṅ dė lä brü-yār, French moralist: b. Paris 17 Aug. 1645; d. Versailles 10 May 1696. He was educated for the law, became treasurer at Caen, and through the influence of Bossuet, was employed in the education of the Duke of Bourbon, grandson of the great Condé, with a pension of 3,000 livres, and was attached to his person during the remainder of his life. In 1688 he published the 'Characters of Theophrastus,' translated into French, to which he added others of his own, in which he represented the manners of his time with great accuracy, and in a style epigrammatical, ingenious, and witty. The work contained 386 «characters»; the 4th edition (1689), 340 additional ones, while the 9th, in press at the time of the author's death, included over 1,100 «characters.» Consult: Rahstede, 'La Bruyère und seine Charaktere' (1886); Allaire, 'La Bruyère dans la maison de Condé' (1886); Pellisson, 'La Bruyère' (1893).

Labuan, lä-boo-än', an island of the Malay Archipelago, belonging to Great Britain, situated on the northwest coast of Borneo; about 12 miles in greatest length by 7 miles in greatest breadth; area, 32 square miles. It is mostly low and marshy, and not very fertile, but it is well supplied with water, and has a good harbor at the settlement of Victoria, on its southeast side. Coal of excellent quality is plentiful, and has been mined for many years. The chief town is Victoria. Pop. 5,853, mostly Malays.

Labur'num, Golden-chain, or **Bean-tree,** a genus of trees and shrubs of the order *Leguminosæ*. The few species, which are natives of southern Europe and western Asia, are characterized by trifoliate leaves and brilliant yellow blossoms in pendulous many-flowered racemes produced during late spring and early summer. The larger species yield a very hard, heavy, tough, fine-grained, dark green or brown wood, which can be highly polished and is valued for inlaying, cabinet work, turning, etc. The species are also prized for ornamental planting in shrubberies, not only for their flowers, but also for their glossy foliage, which remains green until late in the autumn. No part of the plant is relished by insects, and all parts, but particularly the seeds, are reputed poisonous. Nevertheless, it is said, the young stems are greedily eaten by rabbits, and may thus be made to serve as a sacrificial protection to other shrubbery. The best known species, probably, is the English laburnum (*L. vulgare*), which sometimes attains a height of 40 feet but usually not more than 20 feet. It is hardy nearly as far north as Massachusetts. The Scotch laburnum (*L. alpinum*) is hardier, more erect and rigid, bears broader leaves and much longer and slenderer racemes of dark yellow flowers, and continues in blossom about two weeks later than the preceding. By some botanists it is considered only a form or variety of *L. vulgare*. Laburnums thrive in any well-drained soil in either partial shade or full sun. They are readily propagated by seeds generally spring-sown, and also by layers. Choice varieties, of which there are many, are grafted upon seedlings.

Lab'yrinth, a structure having numerous intricate winding passages. The legendary labyrinth of Crete, out of which no one could find his way, but became the prey of the Minotaur, was said to have been constructed by Dædalus. The hint of this legend was probably given by the fact that the rocks of Crete are full of winding caves. The Egyptian labyrinth was a building situated in central Egypt, in the district now called the Fayoum. The building, half above and half below the ground, contained 3,000 rooms. It was probably a place of burial. The labyrinth at Clusium, in Italy, was erected by the Etruscans, according to Varro, for the sepulchre of King Porsenna. Imitations of labyrinths, called mazes, were once fashionable in gardening. They were made of hedges; the best known is that at Hampton Court, near London.

Labyrinthodon'ta, or **Stegocephali,** a group of primitive four-footed animals, forerunners of modern amphibians and reptiles, whose remains are found fossil in Peruvian, Carboniferous and Triassic strata, and which are the oldest known lung-breathing terrestrial quadrupeds. They were first discovered through finding their footprints imprinted in the Triassic rocks (Keuper beds) of Germany, long before the actual fossilized remains were brought to light. The footprints were described at first as those of a hypothetical form to which the name *Cheirotherium* («hand beast») was given. As geological science and research progressed, the remains of the labyrinthodonts were discovered, when a comparison of their structure with the footprints showed that some of the latter were made by these creatures; many of the tracks, however, are unidentified. Later, when a great variety of related remains had been discovered, the term *Labyrinthodonta,* which relates to the curious «labyrinthine» infoldings of the enamel-wall of the teeth, was restricted to a single group or suborder (also called *Stereospondyli*) within the general amphibian order *Stegocephalia.* This suborder contains highly developed and mostly large forms, characterized by the complication in tooth-structure above mentioned, and by co-ordinate anatomical distinctions. The principal genera are *Laxomma, Trematosaurus, Metopias, Capitosaurus, Mastodonsaurus,* and *Labyrinthodon,* the last including the most recent forms of the Upper Trias, at the close of which period the group appears to have become extinct. See STEGOCEPHALIA.

Lac, various products of the lac insect (*Coccus lacca* or *Carteria lacca*), for which see COCCUS. The insects infect the young branches and twigs of various Asiatic trees, especially figs, and excrete resinous and coloring matters under which they become buried often to the depth of more than a quarter of an inch. They are often so numerous at times of migration that the twigs seem to be concealed by red dust. In northern India and in Assam the production of lac is fostered by hanging infested twigs in non-infested trees, and regular collections are made each autumn and spring, the former being of greater commercial importance, the latter mainly for propagating purposes. Trees in ordinary vigor are considered best, and are said to furnish six or eight crops before being given a rest, though some trees may yield more than twenty crops.

Two methods are commonly employed in preparing lac for market. In the commoner, the twigs are broken or powdered and thrown into and kneaded in hot water to melt the resin, dissolve the coloring substance and separate the dead insect remains and wood. Several alternate washings and dryings follow in order to have the resin as free as possible from coloring matter. The dried lac is then suspended in coarse cotton sacks before charcoal fires. The bags are twisted to force out the resin, which is caught in films upon pieces of wood upon which it hardens and becomes commercial shellac. The finest quality is a light brown or deep orange. Imperfect removal of the coloring matter results in dark-colored lac. Button lac and plate lac are merely the drops of various sizes which missed the sticks and fell to the ground. The lac that falls to the ground from the trees is collected and sold as seed lac, a name also given to the resin before it is fused but after it has been purified by washing. The first water mentioned above is strained and evaporated, the purple pigment cut in cakes and marketed as lac dye. The other process of purifying the crude lac consists in crushing between rollers, mixing with water, stirring in a cylinder, precipitating the coloring matter with lime, removing the lac, withdrawing the water, pressing the precipitate into cakes and drying them in the sun. The resin, in this process, is melted by steam heat, poured upon tilted, flattened zinc tubes filled with warm water. After cooling it is marketed.

Lacs are prized because of their varnishing properties, because they can be highly polished when dry, and because they are translucent and, in some of the finer grades, transparent, thus allowing the grain of the wood to show clearly through them. They are also used for making the finest grades of sealing wax, vermilion and other colors being added to them after pulling and twisting to make them opaque.

Lac, or **Lak,** from the Sanskrit *lakshâ,* or *laksha,* that is, 100,000. In the East Indies it is applied to the computation of money. Thus, a lac of rupees is 100,000. A lac of rupees was equal to about $46,350. A lac of Sicca rupees was equal to about $50,000; 100 lacs, or 10,000,000 of rupees, make a *crore.* In 1835 the British government remodeled the currency of India, establishing a more uniform system, and the value of the rupee is now fixed at 32 cents.

Lacaille, Nicolas Louis de, nē-kō-lä loo-ē dė lä-kä-ē, French mathematician and astronomer: b. Rumigny, France, 15 March 1713; d. Paris 21 March 1762. He was educated for the Church, but soon renounced theology for astronomy. He took an important part in the work of measuring an arc of the meridian, and in 1746 was appointed professor of mathematics in the Collège Mazarin. In 1751 he went to the Cape of Good Hope at the expense of the government, where he determined the position of some 10,000 stars with wonderful accuracy. As his departure from the Cape was delayed, he employed the interval in measuring a degree of the southern hemisphere. His works on geometry, mechanics, astronomy, and optics were numerous. Among them are: 'Leçons d'Astronomie,' and 'Astronomiæ Fundamenta'; 'Cœlum Australe Stelliferum'; 'Journal historique du Voyage fait au Cap de Bonne Espérance.'

Lacandones, lä-kän-dō'nēs, an Indian tribe living in Guatemala and Mexico. At one time numerous and powerful, they waged war against the whites. There are now about 1,000 left, of whom a part are friendly to the white people, though retaining their native customs.

Laccadive (lăk'ạ-dīv) **Isles,** a group of small coral islands in the Indian Ocean, about 150 miles off the coast of Malabar. They form 20 separate reefs, containing, however, but 13 islands, only 8 of which are inhabited. The surface soil is naturally so barren that there is little or no spontaneous vegetation on the majority of the islands, and their prosperity must ever depend on the cultivation of the cocoanut. The natives of these islands, a race of Mohammedans called Moplas (of mixed Hindu and Arab descent), are a mild and inoffensive race and dwell in low, thatched, stone-built houses, and live poorly. Vasco de Gama discovered these islands in 1499. They were ceded to the British in 1792. Pop. 6,800.

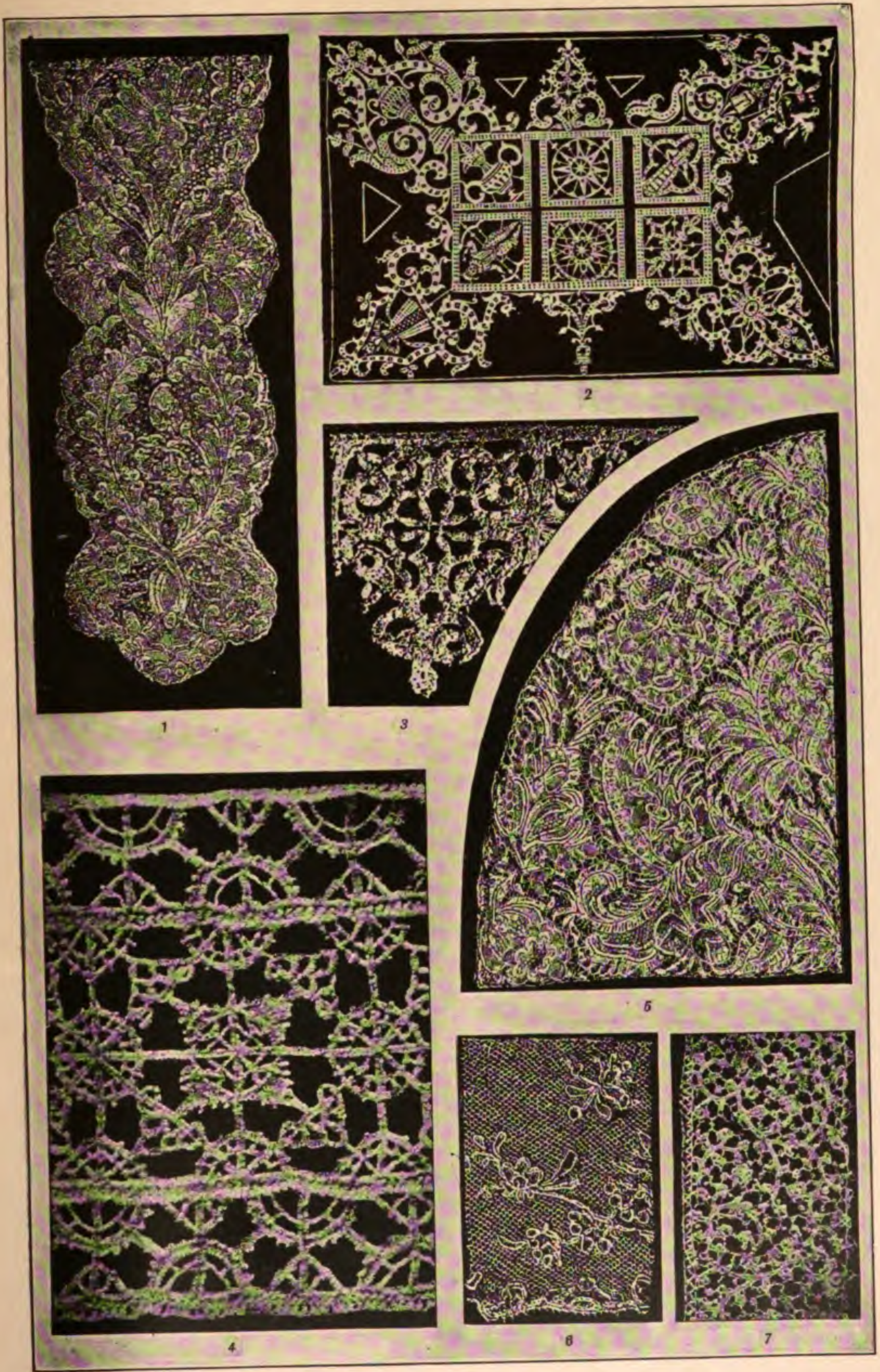
Laccolith, lăk'ō-lĭth, or **Laccolite** (Greek, «stone-pit»), a mass of lava or intrusive rock having a mammiform shape supposed to be due to its spreading laterally when forced up from below, the rocks above it being lifted up into dome-like forms. Laccoliths were first described from mountains in Utah.

Lace. Authorities differ regarding what constitutes a lace fabric, whether we adhere strictly to the technical distinction of an ornamental open work fabric made with threads by knotting, twisting or stitching, or sewing with a needle, or include fabrics that resemble embroidery, made in combination with something woven. In some statements on the subject prepared for the writer some years ago by the late Dr. Thomas Wilson, one of our highest lace experts, it was set forth that lace is not a textile, because not woven, and that it was not embroidery, its peculiarity, and its principal difference from these being that it is made a mesh or loop at a time, each one being complete in itself, and not made on any previously prepared foundation. There are, however, netted fabrics which would never be called lace although made in the same way, because they do not work out an ornamental design or pattern. All authorities agree that lace is an ornamental fabric, the word ornamental being the one characteristic that distinguishes a lace fabric proper from a fine fishing net, or a Yucatan hammock, in which the threads are netted or twisted precisely as some forms of lace are made, though these articles are not lace. On the other hand, there are fabrics made with threads which have the appearance of lace, embodying in their fabrication artistic, graceful, or ornamental designs, but which are not lace, such as drawn-work, where the design is wrought in a woven fabric by drawing out certain threads forming the fabric, as well as other manipulation.

It is impossible to say when or where lace was first made. We know that the art of weaving is older than any written records, and that flax threads were wrought into fabrics by rude weaving processes in the early Stone age in Europe; and that the art was brought to a high degree of perfection in the later Bronze age. We know that attempts at ornamentation, in the form of more or less elaborate fringes are found in some of the delicate Egyptian linens of 4,000 years ago. The art of embroidering is likewise ancient, for it had reached a high state of perfection before the period of the Pharaohs, and has been practised by all countries and peoples from time immemorial. The art of lace making, however, must have developed, by a kind of evolution, from early attempts at the ornamentation of fabrics — possibly as early as the 12th century — these first attempts being mere loops of plaited or twisted threads in the form of small cords, attached to the hems of garments. In the earliest productions of lace there was a foundation of woven fabric, such as very fine linen, and the design was wrought by means of needle-point stitches, or darning, something after the manner of embroidery, the uncovered portion of the woven fabric being afterward removed, and a number of such designs skillfully joined together. Thus, from needlework or embroidery, which has come down from Bible times, we may imagine lacemaking was developed. The fabrication of the true laces, according to Dr. Wilson's definition of «a knotted or twisted fabric made one mesh or loop at a time,» dating back no farther than the latter part of the 15th century, and it has been said that it is extremely doubtful if any particular specimen can be identified as having been made prior to the middle of the 16th century, at which time lace first appeared as a perfected fabric. The point lace of the earliest period of manufacture came nearer being what might be termed a pure art creation than that which followed in a later period; that is to say, the motive or design having been worked out from a thought in the brain of the maker, and not from a set pattern, as was the case in the fabrication of the later or second period needle-point laces. The earliest work is supposed to have been produced by nuns, and the patterns or motives not only give evidence of high artistic merit, with originality, but the practice of a patience on the part of the worker that would hardly be appreciated in this practical and rapid transit age. The designs from the period which followed were quite as beautiful, but were more set, and show the restrictive influence of copying rather than directly producing original forms as the work progressed.

Italy, France, Belgium, and Germany have all claimed the invention of lace-making, but the country to which the honor belongs is unknown. Dr. Thomas Wilson held it remarkable that lace-making should have sprung up, or been invented at about the same period by two entirely distinct processes without relationship or evolution between them, and that the people of the countries wherein either of the inventions was made were not only unknown to each other, but apparently neither had any knowledge of the process of lace-making invented or employed in the other country. One of these processes is by the employment of the needle and a single thread, wherein the work was perfected mesh by mesh, each mesh being completed as the work progressed. The other process was by the use of many threads at once, each one attached to bobbins for the purpose only of separating them, the meshes being made by twisting the threads a greater or less number of times. When each mesh is only partially completed, the thread is carried on to the next, and so on from side to side the entire width of the fabric. While the countries in which these processes were invented are unknown, the evidence points to Venice as the seat of the former, and to Belgium as the seat of the latter. By these two totally distinct

POINT LACE.



1. Valenciennes.
2. Venetian chain lace.
3. Italian bobbin lace, 1691.
4. Double point lace.
5. Brussels guipure.
6. Mechlin point.
7. Relief point lace.

processes fabrics are produced so nearly alike as often to require an expert to distinguish the difference, which, though many times easily determined, yet not infrequently requires the aid of an expert.

It is seen, therefore, that there are two distinct classes of hand-made lace, though many varieties of each:—(1) needle-point lace, and (2) bobbin or pillow lace. Manufactured lace, a third class, is a recent invention, and while it has been the means of bringing a form of ornamental lace fabric within reach of everybody, it can never be compared with the exquisitely delicate and wonderful fabrications of hand-wrought lace, many examples of which are of priceless value.

Lace is chiefly made from linen, cotton and silk threads, usually of the finest numbers, and often specially prepared — some of the finest threads being spun in underground rooms where a damp atmosphere can be maintained, and where the only light is a single beam directed upon the work. Gold and silver threads have also been used, as well as other fibres than those named, such as aloe fibre, or ramie, which is now considerably used in machine-made laces. Mohair and fine wool have also been employed, and even horsehair has been used to stiffen portions of the work in some laces.

Point lace, or fabric made with the needle point, is the oldest known form, its most celebrated examples being the beautiful Venetian designs, and the exquisite French laces of Alençon and Argentan. The early French industry doubtless derived its inspiration directly from Venice, as Colbert, in the time of Louis XIV., is said to have brought from Italy 30 or more of the best lacemakers, and, encouraged by the king, this lace — also known as Point de France — soon became in such vogue that many establishments sprang up in other places in France to supply the demand.

In the oldest designs in point lace there was a foundation of delicate linen, as we have seen; there was also a reticulation of threads attached to a light frame, the patterns being worked over with the button-hole stitch upon these threads and into the linen foundation, which, as the work progressed, was completely hidden by the design. The portions of the foundation outside of the design were cut away, and a number of the design or patterns joined together by means of connecting threads. But sometimes no foundation was employed, the patterns simply wrought upon threads stretched upon the frame as above described, the button-hole stitch being employed. The Venetian point had attained a wonderful perfection by the middle of the 16th century, some of the examples in complexity of stitch, delicacy of design, and artistic merit being masterly conceptions.

Point d'Alençon and Brussels point are still manufactured, the former maintaining many of the distinctive characteristics for which it was so esteemed in the 17th century. Other varieties of needle-point or Guipure laces are Rose point, Portuguese point, and Maltese point. The first-named is especially characterized by the figures being worked in high relief.

Brussels point differs from the Venetian and French needle-point chiefly in the manner of making the stitch, a plain thread being used, and not overcast with the button-hole stitch. In early times Spanish point enjoyed a wide celebrity, but as much Flemish lace was imported into Spain, there was a decline in the industry, though point laces from the Spanish convents, in the early part of the last century, were very similar in character to the Venetian point. Point d'Espagne is said to have been merely a commercial name used in the 17th century, for which the French manufacturers were responsible. Point d'Angleterre owes its name to an effort on the part of the Flemish lace-makers to evade the restrictive measures which were adopted by Great Britain in the latter part of the 15th century, to encourage the home lace industry. The prohibition worked effectively, smuggling was difficult, and in time Flemish lace-makers were induced to settle in England, whereby some of the characteristics of Flemish laces have been perpetuated in the English pillow laces.

It has been claimed that pillow lace manufacture was the invention of Barbara Uttman, of St. Annaberg, Saxony, about 1561, though some authorities assert that she only introduced the manufacture, probably from Flanders. At any rate, paintings from an earlier period give evidence that lace was manufactured in Flanders at least half a century before her time. Pillow lace is made by working the design over a parchment pattern upon a pillow or cushion, the threads being wound upon bobbins. The method was to attach the pattern to the pillow, pins being inserted at regular intervals following closely the lines of the pattern or design. The figure is then wrought by twisting the threads around the pins to form the netted or open-work effect, which characterizes this form of lace. The Flemish laces of the 16th century became quite as famous as the Italian, and the art, as practised in Flanders, was early introduced into many countries of Northern Europe. Among the more important laces that are made with the pillow and bobbins, may be mentioned Brussels (both Saxony and Flemish), Mechlin, Lille, Chantilly, Valenciennes, Honiton, Buckinghamshire, and Limerick or Irish lace.

The Mechlin laces — sometimes called the queen of laces, and which formerly enjoyed a wide celebrity — are products of Mechlin, Antwerp, and Lierre. Ordinary Mechlin is made with a hexagonal mesh, as is also Brussels pillow. The Lille laces embody a simple pattern, marked by a thick thread, and are said to be «the finest, lightest, most transparent, and best made of all grounds.» The Chantilly silk laces were also very simple in character, particularly in regard to their meshed grounds. The black laces were especially noted, and at one time were in high favor. Valenciennes is probably the most important pillow lace now manufactured in Belgium, the cities of Courtrai, Bruges, Ypres, Ghent, and Alost furnishing the larger part of the supply. That made at Ypres especially is the finest quality. Its predominant characteristics are richness of design, beauty of ground, and evenness of tissue. In this lace the mesh is diamond shaped and closely plaited, without twisted sides to the mesh.

The English laces are chiefly made in the counties of Buckinghamshire, Devonshire, and Bradford. Honiton is the best known of the pillow laces of Great Britain, and the most beautiful. It embodies original characteristics that give it an individuality, although it bears some resemblance to Brussels. British point is an imitation of Honiton. Patronized by the late Queen and by other members of the royal family, Honiton soon became popular and its manufacture for many years has been important. Buckinghamshire is said to be an adaptation of the Mechlin, and the patterns to have been used since the 18th century. Laces are made in other places in England, and in Scotland, for the most part as household industries. As has been said, the Irish lace is made at Limerick; it is justly popular, and holds a high position. The lace industry of Russia is said to have been promoted through court patronage after the visit of Peter the Great to Paris. These laces are especially noted for the uniformity of their designs, or patterns.

We have been considering chiefly lace-making in Europe. In more modern times the art has been introduced into many countries, the European nations especially extending the manufacture into their colonies, the natives being the lace-makers. Even the natives of some of the South American countries practise the art, which was taught them by the missionaries of an earlier period, and which, handed down from generation to generation, has become identified with the people. The peasant women of Fayal have for many years produced an exquisite lace, with designs in high relief, the fibre used being finely prepared filaments of the *Agave Americana*, or «Aloe fibre» as it is known. This lace was formerly sold in Paris at very high prices; and it was claimed a few years ago that there were only 25 women on the island who were skilled in its manufacture. Among the beautiful peasant laces should be mentioned those of Russia, Germany, and Crete, though the Cretan lace manufacture has not survived. Malta produces a pillow lace in white and red threads which is noted, and pillow lace is made in Ceylon which somewhat resembles both the Malta and the Buckinghamshire. The natives of Madagascar, under French tuition, make a fabric resembling antique lace, which is an article of export. Wm. E. Curtis is authority for the statement that the women of Paraguay make a very fine pillow lace which is called Nanduty (Nanduti), the art having been taught them by the Spanish nuns. A native fibre is used which is described as soft and lustrous as silk. The designs are beautiful and the fabric indestructible. The lace is made in small squares and these joined together. In Dr. Thomas Wilson's valuable collection there are also some fine examples of aloe fibre lace from Corfu and Zante.

The third class of lace manufactured is that produced by machinery, the chief centres of the machine lace industries being Nottingham, England, and Calais, France. Nearly every kind of lace can be made by machinery, and the manufacture has been brought to so high a state of perfection, that some of the lace is difficult to distinguish from the fabrics produced by hand processes. While the enormous output and cheapness of machine lace has placed the fabric within reach of all classes, it is claimed that the demand for hand-made lace has not diminished, though prices have been affected.

It would be a hopeless task to endeavor to describe the complicated machines in use to-day, to make them understood, in so brief an account as appears in this place, and the student is therefore directed to the ‘History of Machine Wrought Lace,’ by Mrs. Bury Palliser, London, 1865–9, and to the ‘History of Machine Wrought Hosiery and Lace Manufacture,’ W. Felkin, 1867. The first attempt at the invention of a lace machine dates back to 1758 when a stocking weaver was able to produce upon a machine a lace in imitation of Brussels. The really practical machine, however, did not appear until 1809, the invention of Heathcote, which is said to have been suggested from machinery employed in the manufacture of fishing nets. A year or two later there were improvements by several inventors, Morley, Leaver, Clark, and others, which with subsequent improvements, have brought the lace machinery of to-day to such perfection. Machine lace is largely made from cotton, though the new fibre ramie has been employed to some extent, and with best results. This textile is very strong, with the lustre of silk, and takes color well. Some machine-made black ramie lace, a fourth of a yard wide, in the writer's collection of textiles, is an exquisite fabric.

Gold and silver lace, strictly speaking, is not a lace fabric, but rather a woven fabrication resembling in the finished state some kinds of embroidery. It is either made from fine filaments of gold and silver (threads), or from textile yarns or threads wound or otherwise covered with the metal.

Charles Richards Dodge,
Commercial Fibre Expert, Washington, D. C.

Lace Bark, is derived from the inner bark of several species of trees, and is readily detached in sheets or layers like birch bark, each layer being a delicate network of fibre, which when gently stretched a pentagonal or hexagonal mesh is formed which resembles lace. The most commonly known species is the lace bark of Jamaica, *Lagetta lintearia.* It is said that Charles II. was presented by the governor of Jamaica with a cravat, frill, and pair of ruffles made from this substance. The fibre can also be twisted into strong ropes, and in past time thongs and whips were made from it, with which the negroes were beaten. The lace bark tree of New Zealand is an Australian species, *Plagianthus betulinus,* more commonly known as the ribbon tree; its layers of bark showing the same beautiful lace-like texture as the Jamaica form. Another species producing a delicate, white lace-like tissue is the Birabira of South America *Daphnopsis tenuifolia.*

Lacedæmon, lăs-ẹ-dē'mòn. See Sparta.

Lacépède, Bernard Germain Etienne de la Ville, bār-nār zhār-măṅ ā-tē-ĕn dė lä vēl lä-sā-pād, Count de, French naturalist: b. Agen, France, 26 Dec. 1756; d. Epinay, France, 6 Oct. 1825. He abandoned the military profession, for which he was destined, and devoted himself to the study of natural history. His teachers and friends, Buffon and Daubenton, procured him the important situation of keeper of the collections belonging to the department of natural history in the Jardin des Plantes. In 1791 he was elected member of the legislative assembly, and belonged to the moderate party. Napoleon made Lacépède a member of the conservative senate, and conferred on him the dignity of grand-chancellor of the Legion of Honor. After the restoration he was made peer of France. He continued Buffon's ‘Historie naturelle' with the titles 'Histoire des quadrupèdes ovipares et des serpents' (1788–9) and 'Histoire naturelle des reptiles' (1789), and published also 'Histoire naturelle des poissons' (1798–1803); 'Histoire des cétéces' (1804); etc.

Lacertilia, lăs-ėr-tĭl'ĭ-ạ, or **Autosauri,** the order of saurian reptiles which contains the lizards. These are distinguished from the serpents (*Ophidia*) to which they are most nearly allied by the fact that the right and left halves of the mandibles (lower jaws) are connected by a sutural symphysis, whereas those of serpents are connected by a more or less distensible cartilage. The great majority possess well-developed limbs, movable eyelids and cutaneous scales, covered by a horny epidermis, usually thin, but sometimes thick and rising into pointed projections. In a few degraded and burrowing forms the limbs have been greatly reduced, or one pair or even both pairs completely lost, while the eyes may have become buried beneath the skin and the scales nearly or wholly obsolete. The vertebræ are procœlous, except in some of the geckos, where they are amphicœlous; the ribs of the trunk articulate by their capitular heads only, the reduced tubercula being attached to the vertebræ by ligaments. The limbs are typically formed after the pentadactyl pattern; and the shoulder girdle and sternum are complete. The hyoid apparatus resembles that of birds. In the skull the quadrate bone is movable except in a few degraded forms. The skin is covered with scales formed within it, and the epidermis is horny, and is periodically shed in flakes; but in many cases these scales do not overlap and look like scales, but are represented by bony granules, giving a «pebbly» aspect to the surface; or these osteoderms (which never occur in snakes) may form in the ordinary scales. The skin contains no glands; but in many lizards abounds in chromatophores (q.v.) controlled by muscles whose action causes the variations in surface color of which many lizards are capable, and of which they avail themselves as an aid in hiding from their enemies. The group possesses strong power of regenerating lost parts and especially of renewing the tail, which in many families breaks off under a very slight strain.

The *Lacertilia* are a comparative development of the reptilian race, not traceable beyond the beginning of the Tertiary. Fragmentary remains of several existing families occur in the Eocene and Miocene rocks; and the Pleistocene river-deposits of Queensland, among which was a monitor-lizard 30 feet long. The line probably originated in the *Prosauria* (q.v.), represented by a single living form,— the tuatera (q.v.). Lizards are now scattered over all the warmer parts of the world, and seem to be increasing and developing. They are said by Hoffman to include 434 genera and 1,925 species.

The *Lacertilia* are divided into three suborders: (1) *Geckones*, equivalent to the family *Geckonidæ;* (2) *Lacertæ*, typical lizards, including the families *Agaenidæ, Iguanidæ, Zonuridæ, Anguidæ, Helodermatidæ, Varanidæ, Tejidæ, Lacertidæ, Scincoidæ* and others of minor importance; (3) *Chamæleontes*, with a single family.

For more particular descriptions see CHAMELEON; GECKO; LIZARD; and the names of various lizards, as AGAMA; GILA MONSTER; etc.

Lace'wing, a neuropterous insect of the families *Hemerobiidæ* and *Chrysopidæ*. About 40 species are found in the United States, the most common perhaps being the golden-eyed flies of the genus *Chrysopa*. These are greenish, ill-smelling, gauzy-winged creatures usually less than two inches long and feeding little or not at all in the adult state. The females lay their eggs upon the summits of silky threads, by which means they are protected from predaceous enemies. The larvæ, as soon as hatched, crawl down the threads and feed upon the first soft-bodied insect they reach — perhaps a brother. They are considered useful in destroying plant-lice, hence the name «aphis-lions» (q.v.), but in California they attack the larvæ of the useful ladybirds.

Lachaise, François d'Aix de, fräṅ-swä dā dė lā-shâz, French Jesuit confessor of Louis XIV.: b. Château d'Aix 25 Aug. 1624; d. Paris 20 Jan. 1709. He was the provincial of his order when Louis, on the death of his former confessor, appointed Lachaise to that office. The new confessor with admirable tact kept himself clear of the innumerable meshes of court intrigue. Jansenism was at the time a powerful factor in ecclesiastical and political circles, and the Jesuits were its most formidable adversaries, but Lachaise knew how to conduct himself under all circumstances with address, coolness, and sagacity; and never allowed himself to be drawn into violent measures against his opponents. That Louis XIV. married Mme. de Maintenon was owing principally to the counsels of his Jesuit confessor. Lachaise retained the favor of his monarch till his death, and Louis had a country-house built for him to the west of Paris, on an eminence which had received the name of Mount-Louis. Its extensive garden now forms the cemetery of Père Lachaise, the largest in Paris.

La Chaussée, Pierre Claude Nivelle de, pē-ār klōd nē-vĕl dė lā shō-sā, French dramatist, founder of the so-called «pathetic comedy» or melodrama: b. Paris 1692; d. there 14 March 1754. 'Le Préjugé à la Mode' (1735) by him, was the first French pathetic comedy. Of 18 dramas by him, among the best are: 'School of Friendship' (1737); 'Melanide' (1741); 'Love for Love' (1742); 'Pamela' (1743); 'School of Mothers' (1745); 'The Governess' (1747). His plays were all written in verse and followed strictly the rules of the classic drama.

Lachesis, lăk'ĕ-sĭs, in classical mythology, one of the three FATES (q.v.).

Lachine, lä-shēn', Canada, town in Jacques Cartier County, Quebec; on the Grand Trunk railway, eight miles southwest of Montreal; on Montreal Island, which is here connected with Caughnawaga, on the south bank of the Saint Lawrence, by a bridge. It is a popular resort for pleasure parties in the winter, and in summer is largely a residential place for Montreal business men. It has fine residences, churches, schools, a convent, etc. It is best known as the terminus of the Lachine Canal, nine miles long, connecting it with Montreal and built to carry steamers around the Lachine Rapids. All the commerce of Montreal by the Great Lakes passes through this canal. Lachine is also the terminus of the Ottawa line of steamers, and daily at noon in summer a steamer of the Royal

Mail Line leaves the town for Toronto, Hamilton, and Kingston. Lachine has some manufactories, and here are the electric works of the Lachine Power Company (1894–7) with a plant of 21,000 horse-power, designed to furnish power and light for the city of Montreal. The name was given to the site in 1669. In 1689 the Indians burned the town and massacred all the inhabitants. Pop. (1901) 5,561.

Lachlan, läk'lăn, a river of East Australia, rising in New South Wales, to the west of the Blue Mountains. The river makes a semicircular sweep north of about 240 miles, when, pursuing a generally southwest course, it is joined by the Murrumbidgee; the united stream afterward falling into the Murray. The total course is about 700 miles.

Lachmann, Karl Konrad Friedrich Wilhelm, Teutonic and classical philologist: b. Brunswick 4 March 1793; d. 1851. As a student at Leipsic and Göttingen his work lay in Italian, English, and Old German poetry, as well as in Greek and Latin. As a teacher he passed from various gymnasium positions to professorships in the universities of Königsberg and Berlin. His work in textual criticism, both in the early German and the classics, was epoch-making. Editions of Walther von der Vogelweide, Wolfram von Eschenbach, Lucretius (his greatest achievement), Catullus, Tibullus, Propertius, the New Testament, and Shakespeare's sonnets and Macbeth deserve mention among his numerous publications.

Lachrymal (lak'rĭmạl) **Organs.** See Eye.

Lachute, lạ-shoot', Canada, town in Argenteuil County, Province of Quebec, on the Ottawa River; 44 miles from Montreal. It is an important shipping centre for farm and dairy products and has large paper mills, pulp mills, and wood-working industries. Pop. (1901) 2,024.

Lacinaria, lă-sĭn-ā'rĭ-ạ. See Liatris.

Lackawanna (lak-ạ-wŏn'ạ) **River,** a considerable stream which runs through the northeast part of Pennsylvania and flows into the Susquehanna at Pittston; length about 50 miles. Great quantities of the best anthracite coal are mined in the valleys adjacent to this river. The greatest thickness of strata belonging to the coal measures amounts in the central portion of the basin to nearly 1,800 feet. On each side they dip toward the central axis at angles sometimes exceeding 30°, gradually lessening till they are found in horizontal and undulating positions near the centre. Toward each extremity of the basin they gradually shelve upward till replaced by the outcrop of the older rocks.

Lacmus. See Litmus.

Lacon, lā'kȯn, Ill., town and county-seat of Marshall County, on the Illinois River, and on the Chicago & Alton railroad, 35 miles north of Peoria and 128 miles southwest of Chicago. Steamboats ascend the river as far as this point and there are a number of grain elevators and other shipping facilities here; manufactures of wagons, carriages, and woolen goods; a national bank, several newspapers and numerous churches. Pop. (1890) 1,649; (1900) 1,601.

La Condamine, Charles Marie, shärl mă-rē lă-kôṅ-dä-mēn, French scientist: b. Paris 28 Jan. 1701; d. there 4 Feb. 1774. He entered the military profession, but soon renounced this career, and devoted himself to the sciences. In 1736 he was chosen, with Godin and Bouguer, to determine the figure of the earth, by measurements to be made in the equatorial regions of South America, and remained abroad for eight years. In 1748 he was elected a fellow of the Royal Society of London, and in 1760 a member of the Academy of Sciences of Paris. His principal works are his account of his travels (1745), his work on the figures of the earth (1749), and that on the measurement of three degrees of the meridian in the equatorial regions.

Laconia, lā-kō'nĭ-ạ, formerly the name for a large tract of land granted by royal patent to Ferdinand Gorges and John Mason. It was located between the Merrimac and Kennebec rivers, the ocean, and the Saint Lawrence River of Canada. The present State of New Hampshire formed a considerable portion of Laconia.

Laconia, a territory in ancient Greece. See Sparta.

Laconia, N. H., city, county-seat of Belknap County; on the Winnipesaukee River, and on two divisions of the Boston & Maine railroad; about 28 miles north of Concord, the capital of the State, and 100 miles north of Boston. It was settled in 1780–2 by English people from the southern part of New Hampshire. It was incorporated as a town in 1852 and chartered as a city in 1893. It is in an agricultural and manufacturing section, in a beautiful lake region. Its charming scenery, cool climate and opportunities for fishing make it a favorite summer resort. Its principal manufactures are hosiery, railroad cars, machinery, lumber, and paper boxes. The hosiery mills employ about 1,200 operatives; and the car shops employ about 600 men. The State Home for Feeble-Minded Children is located here, also the State Fish Hatchery. The educational institutions of the city are the public and parish schools and the Gale Memorial library. The prominent buildings are 12 churches, an opera house, and the court-house. The three national banks have a combined capital of $200,000. The government is vested in a mayor and 14 councilmen. Pop. (1890) 6,143; (1900) 8,042.

C. N. Vaughan,
Editor of 'Democrat.'

Lacordaire, Jean Baptiste Henri Dominique, French preacher: b. Recy-sur-Ource 12 May 1802; d. Sorèze 22 Nov. 1861. After studying law in Paris he began practice in that city. He was in religion a deist of the Voltairian school, and it was only after reading the 'Essai sur l'Indifference' of Lamennais (q.v) that he came to the conclusion that Roman Catholicism was a primal factor in the development of political life. It was with this view that he determined to become a priest. Entering the Seminary of Saint Sulpice in 1824 he was ordained priest in 1827. In 1835, he was appointed preacher at Notre Dame, and always collected an audience that filled the building. He was, however, bent on a wider project, the revival of the Dominican order, the great order of preachers in France. With this view he revisited Rome in 1838, and after the usual novitiate became a Dominican. The Dominican is originally a Spanish order, and was never popular in France, and Lacordaire had little success in establishing it there. He was in 1848 elected a member of the National Assembly. He was, however, rebuked by his bishop for calling himself a republican and retired from politics, in 1852. His honest indignation against the *coup d'état* expressed in a sermon roused the animosity of Napoleon III., and he was driven from the pulpit, and became director of the Lycée at Sorèze. Consult: Lives by Montalembert (1862); Foisset, 2d ed. (1874); Chocarne (8th ed. 1894); Greenwell (1877); Lear (1882); D'Haussonville (1895); Nicolas, 'Le Père Lacordaire et le Libéralisme' (1880); Fesch, 'Lacordaire, Journaliste' (1897).

La Cosa, Juan de, Spanish navigator: b. about 1460; d. November 1509. He was the companion of Columbus in the discoverer's voyage to Hispaniola in 1493 and settling at Santoña, in Aranham, made his living and reputation as a draughter of charts (1496). He accompanied Ojeda in an expedition to the Pearl coast in 1499; and in 1501 explored the northern coast of South America from Venezuela to Panama. In the course of an expedition on which he accompanied Ojeda, the party on landing in the bay of Cartagena was attacked by Indians, and he perished with his companions, of whom Ojeda alone escaped. His map of the New World, beautifully illustrated on vellum, is in possession of the Spanish government, and is the earliest known, having been made in 1500.

Lacoste, lạ-kōst, Sir **Alexander,** Canadian jurist: b. Boucherville, Quebec, 12 Jan. 1842. He was educated at the College St. Hyacinthe and at Laval University and was called to the bar in 1863. He began practising his profession in Montreal and after a brilliant legal career was appointed Queen's Counsel in 1880. He sat in the Legislative Council of Quebec 1882–4, became a Dominion senator in 1884, and in 1891 chief-justice of Quebec. He was knighted in 1892.

Lacquering, lăk'ėr-ĭng, the art of polishing or veneering with various preparations of lac (q.v.). It is used in many ways. In Tonking where the abundant production is the object of an important trade with the Chinese, it is so used only for varnishing, while in China the same product from the same sources contributes to most artistic applications. When the Annamites propose to lacquer an object, a box, for example, they first stop up the holes and crevices, covering all the imperfections with a coating of diluted lac by means of a flat, close short brush. Then they cover the whole with a thick coating of lac and white clay. This clay, oily to the touch, is found at the bottom of certain lakes in Tonking; it is dried, pulverized and sifted with a piece of fine silk before being embodied with the lac. This operation is designed to conceal the inequalities of the wood and produce a uniform surface, which, when completely dry, is rendered smooth with pumice stone. If the object has portions cut or sunk the clayey mixture is not applied, for it would make the details clammy, but in its place a single, uniform layer of pure lac. In any case, after the pumicing, a third coating, now pure lac, is passed over the piece which at this time has a mouse-gray color. This layer, known under the name of *sou lot,* colors the piece a brilliant black. As the lac possesses the remarkable property of not drying in dry air, the object is left in a damp place. When perfectly dried the piece is varnished and the desired color imparted by a single operation. If the metallic applications are excepted, the lac is colored only black, brown, or red.

The following formulas are in use:

Black.— One part of turpentine is warmed for 20 minutes beyond the fusing point; then poured into three parts of lac; at the same time *pheu deu* (copperas) is added. The mixture is stirred for at least a day, sometimes more, by means of the *cai vay,* a large paddle.

Maroon.— This is prepared by a process similar to the preceding, replacing half of the copperas by an equal quantity of China vermilion.

Red.— The lac, previously stirred for six hours, is mixed with hot oil of *trau,* and the whole is stirred for a day, after which vermilion is added. The latter should be of good quality, so as to have it brilliant and unchangeable.

The operation of lacquering is then ended, but there are parts to be gilded. These are again covered with a mixture of lac and of oil of *trau.* When this layer is dry the metallic leaves are applied, which are themselves protected by a coating composed also of lac and oil of *trau.* All these lac and oil of *trau* mixtures are carefully filtered, which the natives effect by pressing the liquid on a double filtering surface formed of wadding and of a tissue on which it rests. It can only be applied after several months when the metallic leaf is of gold. In the case of silver or tin the protecting coat can be laid on in a few days.

The wood to be lacquered should be absolutely dry. In Japan when wood is well prepared and the faults have been corrected with pure lac it is dried, pumiced and covered with a coat composed of crushed flax mixed with glue. Then a layer of lac is applied and covered with a fine linen fabric which should perfectly adhere in all its parts. This first preparation, suitably dried, serves as a foundation for the successive applications of 33 layers. Each coating is rubbed with a fine-grained stone before drying in the moist chamber. This is done with the greatest precaution, so as to avoid impurities and dust. The last polish is obtained by rubbing with the powder of calcined deer horn. The piece is then ready to receive the application of gold or of silver, which is effected as follows: The design to be reproduced is drawn on very fine paper prepared with a mixture of glue and alum, and on the back of the paper the outlines are traced with a brush of fine rat's hair, dipped in lac previously boiled over a brisk charcoal fire. This paper is then applied to the object to be decorated, and it is made to adhere by rubbing with a spatula, either of minoki wood or of whalebone. When the paper is removed the design is found transferred damp and is rendered more distinct by the application of a white powder by means of a piece of wadding. With one of these transfer papers 20 reproductions can be secured, and the lines can be retraced with the boiled lac, it is said, so as to procure copies almost indefinitely. The outlines remain damp in consequence of the use of the boiled lac, and imperfections can be corrected. In this case the outlines are retraced with a pencil of hare's hair lightly charged with a preparation of lac not boiled. This operation is delicate and requires great care not to displace the lac from the original outlines. When ended the whole is covered with fine gold, silver, or tin powder, as desired; the powder is applied by means of a piece of wadding. If the object to be decorated is of large dimensions the process is conducted on separate parts, and at each step the piece is placed in a damp closet tightly closed, so as to exclude the dust. When the metallic coating has hardened sufficiently the piece is taken out, and the design is covered with a fine transparent lac laid on with a brush of hare's hair. The gilding or silvering of the succeeding part is never attempted until the preceding has been completely dried in the damp chamber. All the parts of the object are finally rubbed with a piece of camelia wood charcoal in order to equalize the thickness, and then polished with the fingers moistened with a mixture of calcined deer horn powder and oil.

La Crosse, Wis., city and county-seat of La Crosse County, on the Mississippi River and the Chicago, M. & St. P., the Chicago & N. W., and several other railroads; 200 miles northwest of Milwaukee, and 130 miles south of Saint Paul.

Industries, etc.— La Crosse is the centre of the farming, manufacturing and dairying trade of western Wisconsin, southern Minnesota and northern Iowa. There are manufactories of boots and shoes, sash, doors and blinds, plows, agricultural implements, boilers and heavy machinery, extensive carriage works, rubber mills, cracker and knitting factories, etc., large flour mills, pearl button factories, steel and corrugated roofing works, woolen mills, a large tannery, mammoth cooperages, five large breweries, affording a market for 150,000 bushels of barley and 100,000 pounds of hops per annum; extensive cigar manufactories and various other industries. The city has five banks with a combined capital of $1,102,700 and doing an annual business of $180,000,000.

Educational Buildings, Public Institutions, etc.— La Crosse has a public library, the Washburn, containing 25,000 volumes, two business colleges, a high school, public school buildings and several Catholic and Lutheran parish schools. The city has a fine city hall, a convent, asylum for chronic insane, Saint Francis and United States Marine hospitals, opera houses, etc.

History and Government.— La Crosse was first permanently settled in 1841 by Nathan Myrick, John M. Levy and others. It became a village in 1851 and was incorporated a city in 1856. Under a revised charter of 1891 the government is administered by a mayor, elected every two years, and a council of 20 aldermen, one-half elected biennially. The council appoints the minor officials. The city owns and operates the waterworks, and has electric light and street railroad plants. Pop. (1903) 30,038.

ROBERT CALVERT,
Secretary Board of Trade.

La Crosse, a Canadian out-door game played with a ball and a stick of light hickory, bent at the top like a bishop's crozier. The stick is 5 or 6 feet in length. Strings of deer-skin are stretched diagonally across the hooked portion of the crosse, forming a network. Only one ball is employed, made of india-rubber, and eight or nine inches in circumference. Posts or poles about six feet high, with a small flag at the top of each, complete the equipment. The players are usually 12 on each side, but their number as well as the distance of the goals apart, is nearly optional. The object of the game is for one side to drive the ball through their opponents' goal. The ball must not be touched with the hand or foot, but is scooped up from the ground with the bent end of the crosse, on which it is carried horizontally, while the player runs toward one of the goals, dodging his antagonists. The National La Crosse Association of Canada was organized in 1867.

Lactantius, Firmianus, often called the Christian Cicero on account of his pure Latin style, lived in the last half of the 3d century and at the beginning of the 4th. Constantine the Great made him tutor of his son Crispus. His most important work is the ‹Institutiones Divinae,› a manual of Christian doctrine written to defend the religion to which he had been converted. His works appear in Migne's ‹Patrologia,› and have also been edited by G. Laubmann and S. Brandt (Vienna 1891).

Lactarene, lăk'tạ-rēn, the casein of milk as commercially prepared by being freed from fat, precipitated by an acid, thoroughly purified, dried, and powdered. It is insoluble in water, but is soluble in an alkali, such as ammonia, and in this form is used, like albumen, for fixing pigment colors in calico-printing. The cloth, after it has been printed, is steamed, the ammonia is driven off, and the pigment is thereafter able to resist the action of water.

Lactation. See MILK, HUMAN.

Lacteals, lăk'tē-ạlz, vessels which, together with the lymphatics, constitute one system for conveying a fluid or fluids from various organs of the body to the veins near their terminations in the heart. The fluid which the lacteals convey is milky after a full meal, and is called chyle, though during intervals of fasting it is a yellowish lymph, as in the lymphatics. The lacteal vessels commence on the intestinal villi, unite with one another in the mesentery and, after leaving the mesenteric glands, discharge their contents for the nourishment of the body into the receptaculum chyli, in front of the second lumbar vertebra. See also LYMPH; LYMPHATIC GLANDS.

Lac'tic Acid ($C_3H_6O_3$). Scheele, in 1780, was the first to describe the acid present in sour milk. In 1832 Liebig and Mitscherlich showed it to be a distinct acid. Lactic acid is widely distributed; there are many modes of preparing it artificially; and its isomeric varieties, of which four have been described, have excited much attention. Its two principal kinds are fermentation lactic acid and paralactic or sarcolactic acid. The former is got from concentrated sour whey by removing the curd, adding lime, filtering, diluting with water, removing the lime with oxalic acid, evaporating, and extracting the lactic acid with alcohol. It is more usual, however, to get it by what is called the lactic fermentation, from sugar or saccharine substances. The sugar is dissolved in water; to the solution is added decaying cheese and a quantity of fine, well-washed prepared chalk, and the mixture is kept for some weeks at between 86° and 95° F. Fermentation begins, and much lactic acid is formed, which combines with the chalk, and forms lactate of calcium. This salt is then decomposed by sulphuric acid, filtered, and the fluid is boiled with carbonate of zinc. Lactate of zinc is formed, which is collected and decomposed by sulphuretted hydrogen. The fluid filtered from the sulphide of zinc is evaporated, and the syrupy fluid which remains contains the lactic acid. Lactic acid is a syrup (specific gravity, 1.215) which remains liquid even at very low temperatures. It deliquesces in moist air, dissolves in all proportions in alcohol and water; has no odor, and has a purely sour taste. It cannot be distilled, or even heated, without undergoing decomposition, lactic anhydrides being formed; at a higher temperature carbonic oxide is evolved, and a variety of products distil over, and charcoal is left in the retort. By oxidizing agents, such as bleaching-powder and nitric acid, it is converted into oxalic acid; by oxide of manganese into aldehyde.

The paralactic or sarcolactic acid was observed in flesh by Berzelius in 1806, and he considered it the same as that derived from milk. Liebig showed that they were not absolutely identical, but the nature of their differences is at present unknown. This acid is readily got from the cold aqueous extract of flesh by adding a solution of baryta, coagulating and removing albumen, concentrating the solution, precipitating the baryta, filtering, and evaporating. The syrupy residue contains the acid. The calcium salt of the fermentation acid contains more water of crystallization; when heated it retains it for a shorter time; and it is more soluble than the sarcolactate. Again, the zymolactate of zinc contains more water, loses it more quickly on heating, but itself endures a much higher temperature without decomposition than the sarcolactate. The zymolactate is much less soluble in water and in alcohol than the other; the crystalline forms of the two salts also are different. The other salts of lactic acid are for the most part crystalline, and soluble in water. Lactic acid forms compound ethers and substitution acids.

Lactic Ferment, a minute organism which, under the microscope, is seen to consist of small elliptical cells, generally detached, but sometimes occurring in chains of two or three. It is developed in milk when it is allowed to stand for some time, and is the cause of the milk becoming sour, the sugar of the milk changing into lactic acid. It is also developed when cheese is added to a solution of sugar, and kept at a temperature of 35° to 40°. See also FERMENTATION.

Lactom'eter, or **Galactometer**, an instrument for ascertaining the different qualities of milk. Several instruments of this sort have been invented. One consists of a glass tube 1 foot long, graduated into 100 parts. New milk is filled into it and allowed to stand until the cream has fully separated, when its relative quantity is shown by the number of parts in the 100 which it occupies.

Lac'tose, sugar of milk ($C_{12}H_{22}O_{11}$), a substance obtained by evaporating whey, filtering through animal charcoal, and crystallizing. It forms hard, white, semi-transparent trimetric crystals, which have a slightly sweet taste, and grate between the teeth. It is convertible like starch into glucose by boiling with very dilute sulphuric acid.

Lactuca'rium, the brown viscid juice of the common garden lettuce, obtained by incision from the leaves and flowering stems, and dried in the air. It is a mixture of various substances, including lactucone, lactucin, lactucic acid, mannite, albumin, etc. Lactucarium is hypnotic, anti-spasmodic, and sedative, and has been recommended in cases in which opium is inadmissible, particularly for children. It has been administered with advantage in chronic rheumatism, diarrhœa, and asthma, in doses of two to five grains.

Ladd, George Trumbull, American educator: b. Painesville, Lake County, Ohio, 19 Jan. 1842. In 1864 he was graduated from Western Reserve College, and after spending the next two years in business, entered Andover Theological Seminary, where he was graduated in 1869. In 1869–71 he preached in Edinburg, Ohio; and was pastor of Spring Street Congregational Church, Milwaukee, Wis., 1871–9. He was called to the chair of philosophy at Bowdoin College in 1879 and held that position until he became professor of philosophy at Yale College in 1881. After the death of President Porter he was made Clarke professor of metaphysics and moral philosophy, which position he still holds. Professor Ladd's career as a student and educator has been one of great activity and success. While still a student at Andover he prepared and published two important articles on the origin of the Synoptic Gospels in the 'Bibliotheca Sacra.' His published works include: 'Principles of Church Polity' (1882); 'Doctrine of Sacred Scripture' (1884); 'Lotze's Outlines of Philosophy' (translation, 5 vols. 1887); 'Elements of Physiological Psychology' (1887); 'What is the Bible?' (1888); 'Introduction to Philosophy' (1889); 'Outlines of Physiological Psychology' (1890); 'Philosophy of Mind' (1891); 'Primer of Psychology' (1894); 'Psychology Descriptive and Explanatory' (1894); 'Philosophy of Knowledge' (1897); 'Outlines of Descriptive Psychology' (1898); 'Essays on the Higher Education' (1899); 'A Theory of Reality' (1899); 'Lectures to Teachers on Educational Psychology' (in Japanese); 'Philosophy of Conduct' (1902). Besides his work as an author he has achieved remarkable distinction as a lecturer. During the academic year of 1895–6 he was chosen a member, for the year, of the Faculty of Harvard University and conducted a graduate seminary in ethics. Twice he has been invited by the Imperial Educational Society of Japan to deliver courses of lectures. In the summer of 1892 and again in 1899 he visited and lectured at Doshisha, Kyoto, Tokyo, Hakone, and Kobe. For his distinguished services to the cause of education he was admitted into audience with the emperor of Japan and by him decorated with the third degree of the order of the Rising Sun. In 1899–1900 he lectured on philosophy before the University of Bombay, India, and on the philosophy of religion at Calcutta, Madras, Benares, and elsewhere. His writings have been adopted as text-books in Russia, India, Japan, and other countries.

His contributions to the science of psychology have been recognized by all experts. He was one of the founders of the American Psychological Association, was its second president and its delegate to the International Congress at Paris in 1900. He is a member of the American Society of Naturalists, American Oriental Society, of the Connecticut Academy of Science, American Philosophical Association, and of the New Haven Historical Society. Among the most permanent of his achievements is the founding of the psychological laboratory at Yale University, which, under his guidance, has become one of the best equipped in the world. From Yale there has proceeded a continuous stream of teachers of philosophy, whose success has been largely due to the teaching and influence of Professor Ladd.

Ladd, Herbert Warren, American journalist and politician: b. New Bedford, Mass., 15 Oct. 1843. After obtaining a high school education he secured a position on the staff of the New Bedford *Mercury,* and went to the field with the 43d and 44th Massachusetts regiments; his report of Gen. Foster's Tarboro march was published in the Boston *Journal* before the New York papers had news of it. He issued a Sunday edition of the *Mercury* to announce the battle of Fredericksburg, the first Sunday paper published in New England outside of Boston. In 1864 he entered the dry goods business and in 1871 formed the firm of Ladd and Davis in Providence, which in 1887 was incorporated as the H. W. Ladd Company, of which he was president. He founded the Commercial Club in Providence, was vice-president of the board of trade for two years, was a generous patron of Brown University, and in 1891 presented to the University a fully equipped astronomical observatory. In 1889 he was elected governor of Rhode Island, was a candidate for that office in 1890 and was defeated, but was re-elected in 1891.

Ladd, William, American philanthropist: b. Exeter, N. H., 1778; d. Portsmouth, N. H., 9 April 1841. He was graduated at Harvard College in 1797, and subsequently took an active part in organizing the American Peace Society, of which he was for many years president, and in behalf of which he labored efficiently until the close of his life. In the interests of this society he edited the ‹Friend of Peace,› commenced by Dr. Noah Worcester, and the ‹Harbinger of Peace,› and published a number of essays and occasional addresses on the subject of peace. He carried his views to the extent of denying the right to maintain defensive war, and caused this principle to be incorporated into the constitution of the American Peace Society.

Ladies' Catholic Benevolent Association, a fraternal society of Roman Catholic women organized at Titusville, Pa., in April 1900. The object of the society is the payment of death benefits. In 1903 there was a supreme council, 780 subordinate branches and 77,000 members. The amount of benefits paid during 1902 was $408,500.

Ladies of the Maccabees of the World, a fraternal beneficiary association, composed exclusively of women and officered and managed by women. It exists solely for the benefit of its members and not for profit, having a lodge system with ritualistic work and representative government, and granting life protection upon satisfactory medical examination. Its jurisdiction is world-wide, but its growth until 1904 has been in North America. It is now entering Great Britain and will extend to other foreign countries where conditions are favorable.

Name.—The name is derived from the Biblical Maccabean Dynasty, upon whose history and achievements the beneficial laws and ritualistic work are founded.

Founders.— The first Supreme Record Keeper was Miss Bina M. West. She established the association in the original 16 States of its jurisdiction, revised and developed its ritualistic work, assisted in combining the separate State jurisdictions under one central government, and instituted the system of general management. Hers was the responsibility of entering new States and unifying the forces of the old. To her efforts were joined in 1895 those of Mrs. Lillian M. Hollister, present Supreme Commander. The success of the Order is due largely to the combined efforts and executive ability of these two leaders. Miss West was born in Saint Clair County, Mich., the daughter of Alfred J. and Elizabeth Conant West, a descendant of Roger Conant, first governor of Massachusetts Colony. In 1891, when there were but 3,000 members in the State jurisdiction of Michigan, she was so signally successful as State organizer that she was made a member of the Great Executive Committee. When the Supreme Hive was instituted 1 Oct. 1892, with world's jurisdiction, she was one of its incorporators and founders. Serving continually as Supreme Record Keeper she has seen the association rise to a position of pre-eminence. The certificates in force amounting to $100,000,000 bear her signature, and in disbursing the Order's benefits she has signed warrants for nearly $4,000,000.

Mrs. Hollister entered the State jurisdiction of Michigan in 1891, and in 1893 became Great Commander of the Great Hive. Its membership then numbered 13,339, which increased to 30,418 during the two years and eight months of her administration. In 1895, while the Order was in its infancy with only 5,770 members, when representing the Great Hive of Michigan at the Supreme Hive Review, she was elected Supreme Commander and has managed the interests of the association with great success and ability.

History.— The origin of the Order dates back to 1886, when the first hive was organized in Muskegon, Mich. It maintained a social existence until 1890, when the benefit feature was introduced. The first hive in New York was organized at Grand Island, 11 March 1891; in Ohio, at Cleveland, 15 July 1892.

The Supreme Hive of the Ladies of the Maccabees of the World was organized in order to establish unity, its incorporators being members of hives in Michigan, New York, and Ohio. No attempt was made to work in the States where Great Hives were already established, but hives were instituted in States not yet organized. Direct representation in the World's Association was soon accorded Michigan, New York, and Ohio, all branches thereby becoming recognized as parts of the Ladies of the Maccabees of the World. In 1898, Ohio transferred its benefit certificates and consolidated wholly with the World's Order. In 1899, New York took the same action, the total membership then reaching 72,424.

With uninterrupted success and prosperity, with 150,000 members and protection of $100,000,000 in force, this association is one of the greatest financial institutions among women of modern times. There is probably no other organization of women to-day, having the direction of business of such magnitude or so valuable to the individual member.

Government.—The government is representative. Business is conducted through the Supreme Hive, Great Hives, or State bodies and subordinate Hives or local branches. The subordinate Hive works under a charter issued upon the application of 20 ladies. Great Hives are composed of representatives of subordinate Hives, and meet triennially, amending State laws and electing State officers. The Supreme Hive is composed of representatives from each State. It meets triennially, and amends Supreme Hive laws, elects Supreme officers, and transacts other business of the Order. The business management is in charge of the Supreme Board of Trustees during the recess of the Supreme Hive. The Order is a representative organization of women, making its own laws, transacting its own business, and making and paying assessments and death benefits involving thousands of dollars, and doing other legitimate acts as outlined by its laws.

Nomenclature.— The officers are commander or president, record keeper or corresponding and financial secretary, finance keeper or treasurer, past commander, lieutenant commander, chaplain, sergeant, sentinel, picket, banner bearers, color bearers, and guards. Lodges are called hives, and meetings, reviews. Strict parliamentary procedure obtains, and the mode of address is formal. The ritualistic work is dramatic, forms, ceremonies, garb, mottoes, and emblems being based upon ancient Maccabee history, and typical of the purposes of the Association.

Statistics.—On 1 July 1904 there were 149,060 members gathered in 2,679 hives in 51 States, provinces, and countries. The total receipts of the Association since organization amount to $5,056,519.33; disbursements in death benefits, relief, and general expense, $3,982,272.21; balance on hand, $1,074,247.12, of which $829,070.27 is invested in government and municipal bonds, the securities required by the laws of the Order. No account is kept by the Supreme Management of the property and funds of Subordinate Hives, or the substantial amounts they expend in relief. The benefits are given upon the National Fraternal Congress Table of Rates, which is based upon the death experience of the older societies and leading life companies. The mortality rate of the Order itself is considerably below this experience. An annual valuation is made, the mortality experience computed, and the protective feature handled along scientific lines. Management expense is reduced to the minimum on a per capita basis of ten cents monthly. The Society prepares its own literature and supplies and also edits the 'Review,' a 16-page monthly sent free to its members. It is incorporated under the laws of Michigan, and authorized by the insurance departments wherever it operates.

BINA M. WEST,
Supreme Record Keeper.

Ladies of the Modern Maccabees, a fraternal beneficial society exclusively for women, founded in 1886, as a social organization, auxiliary to the Knights of the Maccabees. In 1890 it became a life benefit society. The name of the society is derived from the same source as that of the Knights of the Modern Maccabees (q.v.), and although bearing the name «Maccabees,» is entirely distinct in its management and is governed by a different code of laws. The term «Modern» was only recently adopted to distinguish it from another organization bearing a similar name.

The society for a number of years after incorporation confined its work entirely to the State of Michigan, but when the membership had exceeded 70,000 the Great Hive voted to extend its jurisdiction and on 1 June 1905 the society was operating in 24 States and Territories, with a membership of 84,952 and 967 subordinate bodies or «hives.» The order admits as life benefit members all white women, of good moral character and socially acceptable to its members, between the ages of 18 and 50 years, of course subject to the approval of the Great Medical Examiner. The social members, eligible between the ages of 16 and 70 years, pay the same membership fees, dues, and tax, as life benefit members, but are exempt from death assessments.

Certificates are issued for $250, $500, and $1,000, payable to the designated beneficiaries in event of death, or in case of permanent and total disability, they are payable one twentieth semiannually to the member herself. Five per cent from every assessment is placed in an «Emergency Fund» to be used when the interests of the order demand. On 1 June 1905 this fund amounted to over $115,000. Since the organization of the society there has been paid to beneficiaries of deceased members over $3,000,000, and in disability benefits over $75,000. A fund of $10,000 was voluntarily contributed for the endowment of two beds, one each in Grace Hospital, Detroit, and in Butterworth Hospital, Grand Rapids. Funds are now (1905) being raised to endow a third bed to be located in some city in the Upper Peninsula. The order has an official organ, edited monthly and containing the various reports of business transactions.

Ladoga, lä'dō-gä, the largest lake of Europe, situated in Russia, between the governments of St. Petersburg on the south, Olonetz on the east, and Viborg on the north and west; greatest length, north to south, 130 miles; average breadth, about 75 miles; area, 7,156 square miles. It receives no fewer than 70 streams, the principal of which are the Volkhov and Sias, which enters it on the south, and the Svir, which enters it on the east, bearing the surplus water of Lake Onega. It contains numerous islands, and its shores are generally low. Peter the Great Canal (1718–31) and the Alexander II. Canal (1861–6) connect the Neva and the Volkhov; Sias Canal (1764–1802) and the Empress Maria Feodorovna Canal (1883) connect the Volkhov and the Sias; the Svir Canal and the Alexander III. Canal connect the Sias and the Svir. These canals form a navigable chain around the south of the lake.

Ladrones, lạ-drōnz′, or **Marianne** (mā-rĭ-ăn′) **Islands,** a group of 16 islands in the North Pacific Ocean, north of the Caroline Islands. Guahan is the southernmost and largest of these islands; and next in importance is Rota. The islands have a total area of 420 square miles. The inhabitants are tall, robust, and active, and naturally acute, lively, and ingenious. Their huts are constructed of palm-trees, and divided by mats into different apartments. The islands were discovered by Magelhaens in 1521, and were settled by the Spaniards. Magelhaens called them Islas de Ladrones (Thieves' Islands), because the Pacific pirates had a rendezvous here. Toward the end of the 17th century they received the name of Mariana or Marianne Islands, from the Queen of Spain, Marianne of Austria, the mother of Charles II., at whose expense the Jesuit missionaries were sent over, who settled here in 1667. The chief inhabitants are settlers from Mexico and the Philippines. The bread-fruit tree was first discovered here. Guahan (Guam) was ceded to the United States in 1898, and the rest sold by Spain to Germany in 1899. Pop. (1850) 65,000; (1900) 10,175.

Lady-birds, beetles of the family *Coccinellidæ*. This is a very large family of small beetles of rounded, convex form, usually shining and hairless. The head is retracted beneath the pronotum, the legs are short and hidden, and the elytra are usually brightly colored and marked with dark spots. These colors vary much in the same species, especially in the English *Coccinella septempunctata,*— the pet of children. The most widely known American species is the black one with two red spots (*C. bipunctata*), common all over the United States. These beetles live upon plants, shrubs, and trees, depositing their eggs in little bunches on the lower sides of the leaves. The worm-like maggots are active, searching the leaves for plant-lice, which are eagerly devoured, each kind of beetle choosing a special kind of aphid for its food. In this habit the ladybirds, which are sometimes extremely numerous, perform a valuable service, since their minute prey is highly injurious to the plants. See Scale-Insect.

Lady Chapel, a chapel dedicated to the Virgin Mary, and when attached to cathedrals, generally placed eastward from the altar. The lady chapel of Westminster Cathedral is that usually known as Henry VII.'s.

Lady-day, one of the quarter-days in England and Ireland, on which rent is made payable. It falls on 25 March in each year. In the Roman Catholic Church it is held as a great festival under the title of the Feast of the Annunciation. In the English Church it is observed as a feast. In France the day is termed Notre Dame de Mars.

Lady of the Lake, The, a poem by Sir Walter Scott, the most popular of his long narrative poems. The name is derived from the heroine, Ellen Douglas, who lived on an island in Loch Katrine.

Lady of Lyons, The, a play, by Bulwer-Lytton, originally called 'The Adventurer.' It was first produced in 1838.

Lady of Mercy, Our, Order of, a Spanish order dating from 1218. It was founded by James I. of Aragon, in compliance with a vow made during his captivity in France. Pope Gregory IX. approved the order in 1230. It was instituted to redeem Christian captives from the Moors. The order was extended to women in 1261. A branch order instituted in France was suppressed at the time of the Revolution.

Ladyfish, Banana-fish, or **Bone-fish,** the name of several different marine fishes conspicuous for elegance of outline and handsome coloring. They are found mainly in the tropical regions.

Lady's Fan, The. See Giants Causeway.

Lady's or **Fairy's Fingers, Glove, Thimble,** etc., are some among many gardener's names for the purple foxglove (*Digitalis purpurea*), in regard to which much provincial folk-lore might be cited. See Digitalis; Fox-glove.

Lady's Slipper, or **Moccasin Flower,** an orchid of the genus *Cypripedium*, several species of which grow both wild and cultivated in the United States. See Orchids.

Lady's-Smock. See Cuckoo-flower.

La′dysmith, South Africa, town of northern Natal, near the Klip River, 119 miles by rail north by west of Pietermaritzburg, and 322 southeast of Pretoria. It is situated in a hilly region about 30 miles east of the Drakensberg Mountains. During the South African war of 1899–1901 Ladysmith was besieged by a strong force of Boers. The complete investment began on 2 Nov. 1899 and the relief was not effected till 28 February of the following year, or 118 days after the Boers succeeded in isolating the town. The town was held by a garrison of about 10,000 men under Sir George White, and during the siege much damage was done by the shells of the Boer artillery. Disease also carried off many of the garrison and the inhabitants. The relief was effected by Gen. Buller after a hotly contested march by way of Pieters and Nelthorpe, to the east of the railway. Three previous attempts by the same general to relieve the town had to be abandoned owing to the strength of the Boer positions and to their superiority in long-range guns. The population numbers about 4,000.

Laennec, René Théophile Hyacinthe, rė-nā ta-ō-fēl ē-ä-săṅt lĕn-nĕk, French physician: b. Quimper, France, 17 Feb. 1781; d. near Douarnenez, France, 13 Aug. 1826. He took his degree of doctor of medicine in 1814, and his professional reputation was already so high that in the same year he was appointed principal editor of the 'Journal de Médecine.' In 1816 he was appointed chief physician to the Hôpital Necker, and soon after made the notable discovery of mediate auscultation, that is, of the use of the stethoscope. The original discovery, however, is claimed for Auenbrugger (q.v.). In 1819 he published his 'Traité de l'Auscultation Médiate,' having read a memoir on the subject to the Academy of Sciences in the previous year. The remainder of his life was devoted to the perfecting of this new system of diagnosis, and so far as diagnosis is concerned his treatise has produced an effect not attained by any other work. The special study of Laennec was diseases of the chest, and by means of auscultation, either by the direct application of the ear, or of the stethoscope as an auxiliary, he elucidated the pathology of these diseases, which were previously involved in the greatest obscurity.

Laertes, king of Ithaca and father of Ulysses. He had been one of the heroes engaged in the chase of the Calydonian boar, and in the expedition of the Argonauts. The absence of his son in the Trojan war plunged him into melancholy; but the return of Ulysses restored his energies, and he took part in the fight with the suitors of Penelope.

Lætare (lẹ-tā'rē) **Sunday**, called also MID-LENT, the fourth Sunday in Lent. The introit for the day in the Roman Catholic Church begins with the words ‘Lætare, Jerusalem,’ from Isaiah lxvi. 10; hence the name. On this day the music of the organ, suspended throughout Lent, is resumed.

La Farge, lạ färj, **Christopher**, American architect: b. Newport, R. I., 5 Jan. 1862. He studied at the Massachusetts Institute of Technology 1880–1, and in the office of H. H. Richardson (q.v.), and in 1884, with G. L. Heins, took charge of the architectural works of his father, John La Farge (q.v.). Since 1886 he has been a member of the firm of Heins & La Farge, whose principal work is the Cathedral of St. John the Divine, New York. Other works that may be named are the Houghton Chapel at Wellesley College; the Roman Catholic Chapel at West Point; and St. Matthew's Church, Washington, D. C.

La Farge, John, American artist: b. New York 31 March 1835. He was the son of Jean Frédéric de la Farge, French midshipman, who escaped imprisonment at San Domingo, 1806, and eventually settled at Philadelphia. John La Farge began life in a lawyer's office in New York, became much attracted by the Arundel prints of Giotto, turned away from the commonplace of the Hudson River School, and with a deep appreciation of Japanese art found a friend and master in William Hunt. He originally developed a taste founded on Japanese literalism, Pre-Raphaelite conventionality and imaginative conventionalism. Japanese art has certainly determined the line of his success, and his windows in the palaces of New York and elsewhere are beyond criticism. The great ‘Battle Window’ in Memorial Hall, Harvard, the wall painting in Ascension Church, New York, are evidences of his skill as a colorist, however much we may criticise his inadequate conception, and weakness in drawing. Among his published works are ‘Lectures on Art’ and ‘An Artist's Letters from Japan.’

La Farina, Giuseppe, joo-sĕp'pĕ lä fä-rē'nä, Italian statesman and historian: b. Messina, Sicily, 20 July 1815; d. Florence 5 Sept. 1863. He studied at the University of Catania; entered the law; implicated in a revolutionary conspiracy, was compelled to flee from Sicily (1837); and finally settled in Florence (1841), where he devoted himself to historical composition. Having returned to Sicily in 1848, he was there successively member of parliament, and minister of education, public works, and the interior. After the suppression of the revolution in Sicily (1849), he resided in France and Italy, was secretary of the National Italian society, and strongly advocated Italian unity. Following the war of 1859, he reorganized the National Italian society, of which he became president; in 1860 was sent to Sicily to represent Victor Emmanuel; and from 1861 sat for Messina in the Italian parliament. His chief work is ‘Storia d'Italia dal 1815 al 1850’ (2d ed. 1860). He wrote other historical studies, such as ‘Storia della Revoluzione Siciliana nella 1848 e 49’ (1851), dramas, and works of fiction.

La Fayette, Marie Madeleine Pioche de la Vergne, mă-rē măd-lĕn pē-ōsh dė lă vĕrny lă-fă-yĕt, COMTESSE DE, French novelist: b. Paris 16 March 1634; d. there 25 May 1693. All her life she was in the foremost literary circles, after marriage her house being a noted rendezvous of wits and scholars, including Mme. de Sévigné, La Fontaine, and La Rochefoucauld. Her first novel was ‘The Princess de Montpensier’ (1660); followed by ‘Zaïde’ (1670), which among her works ranks next after ‘The Princess of Cleves’ (1678), her most celebrated work, and one of the classics of French literature. She wrote also a ‘History of Henrietta of England’ (1720), and ‘Memoirs of the Court of France for the Years 1688 and 1689’ (1731). Consult Haussonville, ‘Madame de la Fayette’ (1891).

Lafayette, or **La Fayette, Marie Jean Paul Roch Yves Gilbert Motier**, MARQUIS DE, French soldier and statesman: b. Chavagnac, near Brioude, Auvergne (in the present department of Loire), 6 Sept. 1757; d. Paris 20 May 1834. He belonged to an eminent family of France. He was educated in the College of Louis le Grand in Paris, in 1774 entered the army as an officer of the Guards, and on hearing of the declaration of independence by the American colonists determined to lend them his assistance. In 1777 he left France for America with 11 companions, among whom was Baron De Kalb, set sail from Pasages, Spain, in a yacht equipped by himself, and arrived at Georgetown, S. C., 14 April. He proceeded to Philadelphia, and to the Congress there in session volunteered his services without pay. On 31 July he was commissioned major-general, and not long after became a member of Washington's staff. He was severely wounded at Brandywine (11 September), while rallying the American forces from a retreat; was appointed to the command of an expedition for the proposed invasion of Canada, never executed owing to lack of means; and in April 1778 was ordered to join Washington at Valley Forge. On 19 May he was surprised by General Grant with 5,000 troops at Barren Hill (12 miles from Valley Forge), where he had taken post with 2,100 troops and five cannon. Though nearly surrounded by a superior force, he succeeded in extricating himself, recrossing the Schuylkill and reaching Valley Forge in safety. He received the thanks of Congress for his conduct at Monmouth (28 June), where he fought brilliantly under Lee. War between France and England having broken out, Lafayette returned (January 1779) to place himself at the disposal of the French government; obtained for the American cause financial assistance, and the reinforcement of a fleet and 6,000 troops under Rochambeau; and 11 May 1780 rejoined the American army. He was shortly afterward stationed at Tappan with a light infantry corps of observation, and was a member of the court of general officers by which Major André was tried and condemned to death (29 Sept.). On 20 Feb. 1781 he was sent by Washington with 1,200 New England and New Jersey troops to aid in the defense of Virginia. Reinforced, he pursued Cornwallis from near Charlottesville to Yorktown, thus materially contributing to the decisive operations by which the war was virtually concluded. He sailed from the United States in December 1781, but again returned in 1784, when he was enthusiastically received. He was called to the Assembly of the Notables in 1787, and was elected a member of the States-General, which took the name of National Assembly (1789). Two days after the attack on the Bastille he was appointed (15 July) commander-in-chief of the National Guard of Paris, and gave them the tricolor cockade. It was through his means that the lives of the king and queen were saved from the mob that had taken possession of the palace at Versailles (5–6 Oct.). After the adoption of the constitution of 1790 he resigned all command, and retired to his estate of La Grange. He had previously resigned his title, the abolition of titles having been decreed by the National Assembly. The first coalition against France (1792) soon called him from his retirement. Being appointed one of the three major-generals in the command of the French armies, he established discipline, and defeated the enemy at Philippeville, Maubeuge, and Florennes, when his career of success was interrupted by the factions of his country. During the Reign of Terror commissioners were sent to arrest him, but he escaped to Flanders. Having been captured by an Austrian patrol (19 August), he was delivered to the Prussians, by whom he was again transferred to Austria. He was carried with great secrecy to Olmütz, where he was subjected to much privation and suffering, and whence he was not released until 25 Aug. 1797. He returned to his estate at La Grange, and taking no further part in public affairs, devoted himself to agricultural pursuits. In 1818 he was chosen member of the Chamber of Deputies, where he was a constant advocate of liberal measures. In August 1824 he landed at New York on a visit to the United States, upon the invitation of the President at the request of Congress, and was received in every part of the country with the warmest expression of delight and enthusiasm. Congress voted him $200,000 and a township of land, his own fortune having been mostly lost by confiscation during the Terror. In 1827 the Chamber of Deputies was dissolved, and Lafayette was again returned a member by the new elections. During the revolution of July 1830 he was appointed general-in-chief of the National Guard of Paris, and though not personally engaged in the event, was, through his activity and name, of the greatest service. When the National Guard was established throughout France, after the termination of the struggle he was appointed their commander-in-chief. Of Lafayette, Edward Everett said: «Who, I would ask, of all the prominent names in history, has run through such a career, with so little reproach justly or unjustly bestowed?» Consult: ‹Mémoires et Manuscrits de La Fayette› (1837–40); Tuckerman, ‹Life of Lafayette› (1889); Tower, ‹The Marquis de La Fayette in the American Revolution› (1895).

Lafayette, lä-fā-ĕt', Ala., town and country-seat of Chambers County, on the Central Railroad of Georgia, 85 miles northeast of Montgomery. Here is the seat of Lafayette College (q.v.), founded in 1885. There is a large trade in cotton and other products, the town being a distributing point for a large section of country. Pop. (1890) 1,369; (1900) 1,629.

Lafayette, Ind., city and county-seat of Tippecanoe County, on the Wabash River, and the Cleveland, C., C. & St. L., the C. I. & L. (Monon), the Lake E. & W., and the Wabash R. R.'s.; 64 miles northwest of Indianapolis. The Indianapolis & N. W. traction lines also connect the city with outside points.

Industries.— Lafayette derives its chief business from agriculture, being the farming and manufacturing centre for the surrounding country. Other industries are: carpet mills, breweries, soap factories and flour mills.

Banks, Churches, Public and Educational Institutions.— There are five National, two State, and one savings banks, and two loan and trust companies, having a combined capitalization of $965,000 and deposits of about $10,000,000. There are 24 church edifices. Lafayette is the seat of Purdue University, embracing the State Agricultural College, contains a high school, supplemented by an excellent public school system, a public library, containing over 20,000 volumes, and the Indiana State Soldier's Home.

History, Government and Population.— The city stands six miles above the site of the old French fort, built in 1720 and called Post Oniatanon. In 1760 the fort was surrendered to the British, but later in the same year was captured by the Indians. Lafayette was first settled in 1826 and chartered as a city in 1853. It is governed, under the General Indiana Charter which went into effect in April 1905, by a board of public works composed of three members, and a city council composed of 10 members elected for four years. The city owns and operates the waterworks, has electric lights, electric street railway and a well-equipped fire department. The foreign element in the population is small. Pop. (1890) 16,243; (1900) 18,116; (1905) Lafayette and West Lafayette combined 28,000.

Lafayette, La., town in Lafayette Parish; on branches of the Southern Pacific railroad; about 120 miles west by north of New Orleans. It is 41 feet above the level of the Gulf, and has a healthy climate. It is the commercial centre of a region noted for its sugar, cotton, and rice, and it is near extensive oil fields. It is the seat of the Southwestern Louisiana Industrial Institute (q.v.) and the Mount Carmel Academy (q.v.). It has good church buildings and public and parish schools. The town has a municipal ownership of the electric-light plant and waterworks. Pop. 3,500.

Lafayette, a fish. See Goody.

Lafayette College, a Presbyterian college at Easton, Pa.; founded in 1832. In 1902 it had 30 professors and instructors; 426 students; 20,600 volumes in the library; $258,250 in productive funds; grounds and buildings valued at over $1,000,000; benefactions, $408,000; income, $68,000; number of graduates, 1,811. It was originally chartered in 1826, but owing to the failure of the legislature to make any appro-

MARQUIS DE LAFAYETTE.

priation the college was not opened until 1832. Since the Civil War the college has had a notable growth. Ario Pardee of Hazleton endowed a scientific department in 1866. There are now 30 buildings, including Pardee Hall, a memorial library and the Gayley Laboratory of Chemistry and Metallurgy. Marcus W. Kratz,
Registrar.

Laf'fan, Bertha Jane, “Mrs. Leith Adams,” English novelist. She has been on the staff of ‘All the Year Round’ from 1878. She was married to Surgeon-General Leith Adams, and subsequently to Rev. R. S. de Courcy Laffan. Her novels have been popular and among them are: ‘Winstowe’ (1879); ‘Bonnie Kate’ (1892); ‘Accessory After the Fact’ (1898). She has published several songs.

Laffitte, Jacques, zhăk lă-fet, French banker: b. Bayonne 24 Oct. 1767; d. Paris 26 May 1844. He entered the banking-house of the senator Perregaux, and in 1809 became the head of the firm, which he made one of the first houses in France. In the same year he was appointed director of the Bank of France, and in 1814 governor of the same establishment. When the credit of France, in 1815, was at a very dangerous crisis, Laffitte advanced 2,000,000 francs in ready money, by which means a necessary article in the capitulation of Paris was settled. He was elected to the Chamber of Deputies in 1816. In 1819 he was deprived of the presidency of the bank, which was bestowed on the Duke of Gaeta; yet he was in 1822 unanimously re-elected to the office of *régent de la banque* (director). Laffitte was again elected to the Chamber of Deputies in 1827, and took an active part in the revolution of July 1830, being one of the deputies who signed the protest, and declared themselves deputies of France, in spite of Polignac's order to annul the election. He became bankrupt in his latter days, and was obliged to sell all his property to pay his debts; but his Paris hôtel was preserved to him by a national subscription.

Lafitau, Joseph François, zhō-zĕf frăṅ-swä lă-fē-tō, French missionary and writer: b. Bordeaux 1670; d. there 3 July 1740. He belonged to the Society of Jesus, and was for some years attached to their missions in Canada. On his return to France, he published: ‘Mémoire concernant la précieuse plante ging-sang de Tartarie’ (1718), the plant here noticed, which was highly valued by the Chinese, having been found by Lafitau in the Canadian forests; ‘Mœurs des Sauvages Américains comparées aux Mœurs des premiers Temps’ (1723); ‘Histoire des Découvertes et des Conquêtes des Portugais dans le Nouveau Monde’ (1733).

Lafitte, lă-fēt', **Jean,** American pirate and smuggler: b. France 1780; d. Silan, Yucatan, 1826 (according to some authorities, at sea 1817). He was at one time a privateer in the employ of Cartagena for the destruction of British and Spanish commerce. Soon he turned to piracy, and by 1812 was leader of a band of desperadoes who maintained headquarters on the island of Grande Terre in Barataria Bay, and thence plundered traders in the Gulf. During the War of 1812, Commodore Percy, commanding the British naval force in the Gulf waters, unsuccessfully endeavored to obtain Lafitte's co-operation in the expedition against New Orleans. Lafitte later offered his services to the governor of Louisiana and General Jackson, on condition of full pardon for himself and followers. He assisted in the construction of the defenses of Barataria Bay, and in command of a detachment of his band participated most creditably in the battle of New Orleans (8 Jan. 1815). President Madison by proclamation confirmed the amnesty granted to the outlaws. Lafitte was a bold smuggler, and brought to Louisiana cargoes of negro slaves. He was associated with a brother, Pierre, with whom he is often confounded. He is the hero of J. H. Ingraham's story, ‘Lafitte.’

Laflamme, lă-flăm', **Toussaint Antoine Rodolphe,** Canadian jurist: b. Montreal 15 May 1827. He was educated at St. Sulpice College, in 1849 was admitted to the bar, became an editor of ‘L'Avenir,’ and was a member of the ‘Rouge’ or liberal reform element in Quebec province. At the same time he continued his legal practice, and was appointed professor of the law of real property in McGill University. In 1872–8 he sat in parliament for Jacques Cartier County, in 1876 was minister of inland revenue, and in 1877–8 minister of justice.

La Follette, lă fŏl-lĕt, **Robert Marion,** American lawyer and politician: b. Primrose, Wis., 14 June 1855. He was graduated from the University of Wisconsin in 1879, and the next year was admitted to the bar. He became district attorney of Dane County in 1880, retaining that position till 1884, when he took up the regular practice of his profession. In 1887 he was elected to Congress, serving till 1891; he won reputation as an orator, and as a member of the committee of ways and means took a prominent part in the framing of the McKinley Tariff Bill. At the close of his service in Congress he resumed his practice, and remained active in politics, becoming one of the leaders of the younger men in the Republican party. He was elected governor of his State three times, 1900, 1902, and 1904. The chief aims of his administrations has been to introduce certain tax reforms and to pass a primary election law.

La Fontaine, lă fŏn-tān', Fr. lă fôṅ-tān, **Jean de,** French poet: b. Chateau-Thierry, Champagne, 8 July 1621; d. Paris 13 April 1695. He studied for a time without much seriousness for the priesthood, turned to literature, found a patron in the minister Fouquet and later in others of prominence, and was in habits of intimacy with Molière, Boileau, Racine, and all the first wits of Paris. The candor and simplicity of his character acquired for him the title of *le bon homme.* But he was no favorite with Louis XIV., and was the only writer of merit of the time who did not share in the royal bounty. In 1683 he was elected to the Academy. He is best known for his ‘Fables,’ which abound in keen analysis, wise lessons, and skilful descriptive passages. Both the ‘Tales’ (1665) and the ‘Fables’ of La Fontaine have been superbly printed. Of the former (the license of which keeps them out of many libraries) the best edition is that of 1762, with Eisen's designs and vignettes. Of his ‘Fables’ innumerable editions have been printed; but the most magnificent is that in four volumes folio (1755–9), in which each fable is adorned with a plate. Gustave Doré also executed illustrations for these poems. La Fontaine wrote further works, including ‘Les Amours de Psyche,’ a romance, and ‘Le Florentin’ and ‘L'Eunuque,’ comedies; and he edited a collection of religious verse. The best edition of his works is that by Regnier in the ‘Grands Ecrivains’ series (9 vols. 1888–92). Consult also the study by Lafenestre (1885).

Lafontaine, Sir **Louis Hippolyte,** Canadian lawyer and politician: b. Boucherville, Lower Canada, October 1807; d. Montreal 26 Feb. 1864. He achieved prominence at the bar and in Dominion politics, but in 1838 was charged with high treason as implicated in Papineau's rebellion, and though not convicted, withdrew to England, thence to France, and returned to Canada only after the end of the rebellion. In 1848–51 he was premier, and in 1853 became chief justice of the Queen's bench.

La Fourche, lä foorsh, a bayou in Louisiana, and an outlet of the Mississippi River, which begins at Donaldsonville, on the right bank, and flows southeast to the Gulf of Mexico. It has a total length of 150 miles and is navigable by steamboats 100 miles from its mouth.

Lago Maggiore, lä′gō mäd-jō′rĕ, or **Lake of Locarno** (anciently Verbanus), a large lake in northern Italy, and Switzerland, extending from Sesto to Locarno, about 39 miles long and 7 broad. It is 621 feet above the level of the sea, and at the northern end in some places as deep as 2,500 feet. On all sides it is surrounded by hills, planted with vineyards and plantations of chestnuts, interspersed with villas. There are several islands, two of which, Isola Bella and Isola Madre, called Borromean Islands, are laid out in gardens and pleasure grounds.

Lagonegro, lä-gō nā′grō, a small town 38 miles south of Potenza, Italy, noted as having been the scene of a great French victory in 1806.

Lagoon′ (from the Latin *lacuna*, a gap or hollow), shallow lakes or creeks connected with the sea, which are found along low-lying coasts. It is also applied to the expanse of water in the interior of those coral reefs which present to view above the surface of the water nothing but an external fringe. See Coral.

Lagos, lä′gōs, Mexico, city in the State of Jalisco, on the Mexican Central railroad. It lies 6,000 feet above the sea; was founded in 1563 by Francisco Martel, and after the war of independence was named Lagos de Moreno after its defender, Pedro Moreno, who died here in battle against the Spaniards in 1817. Pop. (1900) 14,000.

Lagos (lä′gōs) **Colony,** a British possession in West Africa, consisting of Lagos Island and the coast between Dahomey and southern Nigeria; area, 985 square miles. The principal products are palm oil and kernels, ivory, gum copal, cotton, rubber, cocoa, and coffee. There is a railway from Lagos to Abeokuta 60 miles inland. The government consists of a governor and executive and legislative councils. The town of Lagos, the largest on the West African coast, has a population of 35,000. Pop. of colony 85,607.

La Grande, lạ-gränd′, Ore., city in Union County, on the Grande Ronde River, and on the Oregon railroad; 300 miles east of Portland. It is the commercial and trading centre of an extensive live-stock, grain and fruit growing region, and has flour mills, brick works, lumber mills, beet sugar, and other factories. Pop. (1890) 2,583; (1900), 3,000.

Lagrange, Joseph Louis, zhō-zĕf loo-ē lä-gräṅzh, Comte, French mathematician: b. Turin 25 Jan. 1736; d. Paris 10 April 1813. His great-grandfather was a cavalry officer in the French army, who afterward passed into the service of Sardinia. When scarcely 19 Lagrange was made mathematical professor in the artillery school at Turin. In 1764 he obtained the prize of the Academy of Sciences in Paris for a treatise on the libration of the moon, and in 1776 for another on the theory of the satellites of Jupiter. About this time he made a visit to Paris, where he became personally acquainted with D'Alembert, Clairaut, Condorcet, and other savants. Soon after his return he received an invitation from Frederick the Great to go to Berlin, with the title of Director of the Academy. Here he lived for 20 years, and wrote his great work ‘La Mécanique analytique.’ After Frederick's death (1786) the persuasion of Mirabeau and the offer of a pension induced him to settle in Paris. He was the first professor of geometry in the Polytechnic school, and the first inscribed member of the Institute. He took no active part in the revolution, and the law for the banishment of foreigners was not put in force against him. In 1794 he was appointed professor in the newly-established Normal School (Ecole Normale Supérieure) at Paris (1794), as well as in the Ecole Polytechnique. Napoleon bestowed upon him distinguished tokens of his favor, and he became member of the senate, grand officer of the Legion of Honor, and count of the empire. The most important of his works are his ‘Mécanique analytique’ (1788); ‘Théorie des Fonctions analytiques’ (1797); ‘Résolutions des Equations numériques’ (1798); ‘Leçons sur le Calcul des Fonctions’; and ‘Essai d'Arithmétique politique.’

La Grange, lạ-grānj′, Ga., city and county-seat of Troup County, on the Macon & Birmingham and on the Atlanta & West Point R.R.'s; 70 miles southwest of Atlanta. A Baptist Female college and a Methodist Female college are located here. The town was settled in 1826, and was incorporated two years later. Under a charter of 1891, the city is governed by a mayor elected annually, and a council elected every two years. It has numerous industries, including cotton and cottonseed-oil mills. Pop. (1890), 3,090; (1900), 4,274.

La Grange, Ill., town in Cook County, on the Chicago, Burlington & Quincy railroad; 15 miles from Chicago. It is a suburban and residential town largely populated by Chicago business men, and has numerous churches, public and private schools, and two weekly newspapers. Pop. (1890), 2,314; (1900), 3,600.

La Grange, Ind., town and county-seat of La Grange County, on the Grand Rapids & Indiana railroad; 45 miles northwest of Fort Wayne. It is the centre of a considerable agricultural section and has numerous manufacturing industries, including flour and lumber mills, chair factories, agricultural implement works, etc. Pop. (1890), 1,784; (1900), 1,703.

La Grange, Texas, city and county-seat of Fayette County, on the Colorado River, and on the Southern P. and the Missouri, K. & T. R.R.'s; 80 miles southeast of Austin. It has a cotton trade of 15,000 bales annually, and is an important shipping point for grain and livestock. There are cotton gins and cottonseed-oil mills and other industries here. Pop. (1890) 1,626; (1900) 2,392.

La Grange College, an educational institution in La Grange, Mo.; founded in 1858 under the auspices of the Baptist Church. It had in 1901 12 professors and instructors; 161 students; 7,000 volumes in the library, and productive funds of $12,500. Its grounds and buildings were valued at $20,000; income, $3,000.

La Grita, lä grē'tä, town in Venezuela, in the state of Los Andes; located in a beautiful mountain region 5,000 feet above the sea, and surrounded by coffee, sugar, and tobacco plantations. It lies 75 miles south of Lake Maracaibo. The town, which has a most delightful climate, was founded in 1576 by Francisco de Càceres. Pop. (1900) 9,700.

La Guayra, lä gwī'rä, or **La Guaira,** city and seaport in Venezuela, about 5 miles from Caracas, on the Caribbean Sea. It was founded in 1588 and is the most important commercial city in the republic. The harbor which was formerly an open roadstead has been improved by a breakwater, and is well protected by a fort. La Guayra exports coffee, cocoa, and skins, and imports chiefly manufactured goods. There is a railroad from here to Caracas. The port was blockaded in 1903 by the British and German fleets, pending the settlement of claims against the government. Pop. 11,000.

Laguna, lä-goo'nä, N. Mex., pueblo town on the Atchison, Topeka & Santa Fé railroad; 40 miles from Albuquerque. The population, some 1,100, is composed largely of various branches of the Laguna Indians, who are industrious and self-supporting. The government granted them 17,000 acres, of which only 215 acres can be used for farming purposes.

Laguna, Philippines, a province of the island of Luzón, situated in the southern part of the island, on the south and east shores of the Bay Lagoon (q.v.); area, including dependent islands, 752 square miles. The province is mountainous in the north, and in the southwest is Mt. Maquiling, 3,666 feet high; there are a number of rivers, and the soil is very fertile. All varieties of tropical plants and trees found in the Philippines grow here; the staple products are sugar, rice, corn, cotton, tobacco, indigo, cocoanut, betel nut, and fruit and vegetables. There are a number of industries, including mills for the extraction of cocoanut oil, furniture manufacture, the manufacture of cheese, and stock raising; there is considerable export trade, products being sent to all parts of the archipelago. Civil government was established in the province in July 1902. The inhabitants are mostly Tagalogs; pop. 170,000.

La Habana, Cuba. See HAVANA, PROVINCE.

Lahee, Henry Charles, American writer on musical topics: b. London, England, 2 July 1856. He was educated at St. Michael's College, Tenbury, Worcestershire, where he was chorister 1865–9, and was in the English mercantile marine 1871–9. Coming to the United States he was secretary of the New England Conservatory of Music at Boston 1891–9, and since the last named date has conducted a musical agency in Boston. He has published: 'Famous Singers of Yesterday and Today' (1898); 'Famous Violinists of Yesterday and To-day' (1899); 'Famous Pianists' (1900); 'Grand Opera in America' (1901); 'The Organ and its Masters' (1902).

Lahore, lä-hōr', India, city and capital of the Panjab, on the left bank of the Ravi, 265 miles northwest of Delhi. The city proper covers an area of 640 acres, and is surrounded by a brick wall 16 feet high, flanked by bastions. The streets are extremely narrow, and the houses have in general a mean appearance. Here are the fort, the palace of Jehanghir, the Pearl Mosque, the Great Mosque, the mausoleum of Runjeet Singh, and other attractive structures. The European quarter and the Meean Meer cantonment (at a distance of several miles) lie outside the walls on the south and southwest. Among the modern buildings and institutions are the Panjab University, the Oriental College, Medical School, Law School, Mayo Hospital, Victoria Jubilee Hall, school of art, cathedral, railway station, etc. In 1524 Lahore became the seat of the Mogul empire, under which it reached its greatest splendor. Before passing into the hands of the British it was the capital of the Sikhs. Pop. 176,854. Lahore division (commissionership) has an area of 24,872 square miles, and pop. 4,579,794. The Lahore district has an area of 3,648 square miles; pop. (1900) 1,075,379.

Laing, läng, **Alexander Gordon,** British African explorer: b. Edinburgh, Scotland, 27 Dec. 1793; d. near Timbuktu, Africa, 26 Sept. 1826. After serving for several years in the English army, he entered on his career as an African traveler in 1822, when promoted to the command of a company in the Royal African Corps. An opportunity having presented itself of proceeding on the discovery of the course of the Niger, it was arranged that he should accompany the caravan from Tripoli to Timbuktu. He left Tripoli in July 1825, in company with the Sheik Babani, and after a tedious journey of nearly 1,000 miles arrived at Ghadames; and on 3 December reached Ensala. He quitted Ensala on 10 Jan. 1826, and on the 26th entered on the sandy desert of Tenezaroff. After some fighting with the Tuaregs he arrived at Timbuktu on 18 August, the first European who had ever reached that city. After a short stay he set out on his return, but was assassinated on 26 Sept. 1826. The murder was committed by the order of the son of the prime minister of Tripoli, whose agent Babani was. He prepared for the press a work published in 1825, under the title 'Travels in the Timmannee, Kooranko, and Soolima Countries of Western Africa.'

Laing, Malcolm, Scottish historian: b. Mainland, near Kirkwall, Orkney, 1762; d. there November 1818. He is the nephew of Samuel Laing (1780–1863). He was a lawyer by profession, and later a member of Parliament, but devoted himself principally to historical investigation. He wrote a continuation of Henry's 'History of Great Britain' (1785), and 'History of Scotland' (1800), which may be regarded as supplementary to Robertson's history. In the preliminary dissertation he presents an elaborate argument to prove Queen Mary's participation in the murder of Darnley.

Laing, Samuel, Scottish author: b. Kirkwall, Orkney, 4 Oct. 1780; d. Edinburgh 23 April 1863. Entering the army in 1805 he served in the Peninsular War and in 1834 traveled in the Scandinavian countries. He published ‘Journal of a Residence in Norway 1834–6’ (1836); and ‘A Tour in Sweden’ (1839), but is best known by his important translation of the ‘Heimskringla or Icelandic Chronicle of the Kings of Norway,’ with a ‘Preliminary Dissertation’ (1844).

Laing, Samuel, English statesman and philosophical writer: b. Edinburgh 12 Dec. 1812; d. Sydenham Hills, Kent, 6 Aug. 1897. He is the son of Samuel Laing (1780–1863). He was prominently identified with railway legislation in England, was for many years prominent in Parliament, and from 1861 to 1863 held the office of finance minister to India. Of his works, ‘Modern Science and Modern Thought’ (1886), and ‘A Modern Zoroastrian’ (1887), have occasioned some discussion. His other publications of a miscellaneous character include: ‘India and China’ (1863); ‘A Sporting Quixote; or the Life and Adventures of the Hon. Augustus Fitzmuddle’ (1886); ‘The Antiquity of Man’ (1890); ‘Human Origins’ (1892).

Laird, lārd, **David,** Canadian politician: b. New Glasgow, P. E. I., 1833. He was educated in the Presbyterian Theological Seminary at Truro, N. S., and subsequently established the ‘Patriot’ in Charlottetown, a journal which he edited for many years. In 1871 he became a member of the Assembly of Prince Edward Island, and after the admission of the province to the Dominion, was a member of the House of Commons, 1873–6. He was lieutenant-governor of the Northwest Territory 1876–81, and while minister of the interior 1873–6, concluded the Qu'Appelle treaty which extinguished by purchase the title of several tribes to 75,000 square miles of territory on the route of the Canadian Pacific railway.

Laird, John, English ship-builder: b. Greenock, Scotland, 14 June 1805; d. Birkenhead, Cheshire, England, 29 Oct. 1874. His ship yards were at Birkenhead, on the other side of the Mersey from Liverpool, and he was for a long time the head of the firm of John Laird and Sons. He was the first builder of iron steamships, and built the John Randolph, the Nemesis and the Alabama. The first was the earliest iron vessel that crossed the Atlantic; the second the first armed vessel of iron. The historv of the Alabama is well known. He entered Parliament in 1861 when he retired from active business.

Lairesse, Gerard de, Dutch painter and etcher: b. Liège, Belgium, 1640; d. Amsterdam 11 June 1711. He was early a pupil of his father Regnier Lairesse and of Flemalles, and left them for Utrecht, and afterward Amsterdam, where he labored hard for perfection in his art. He first of all confined himself to models of the antique, and the classical ideals of Poussin. His work was thus distinguished by somewhat wearisome mannerism, and his pictures very frequently seem painted in an unnatural silvery, metallic tone. His masterpieces are to be seen in Amsterdam, Schleissheim, Cassel, and in the Louvre, Paris. His ideas on art, as dictated to his pupils and associates, together with his etchings, were published after his death in two volumes, under the title ‘Het Groot Schilderboek’ (1712). The work has been translated into German, French and English, and has had a great influence in the art education of the 18th century.

Lais, lā'ĭs, the name of two Greek hetæræ, celebrated for their remarkable beauty. The first lived at Corinth at the time of the Peloponnesian war; the most eminent and wealthy men of the time, including Aristippus the Cyrenaic philosopher, and Diogenes, the cynic, fell under her spell. The younger Lais was the daughter of Timandra and was born at Hyccara, Sicily, 422 B.C. She came to Corinth in her seventh year and was educated in her profession by the painter Apelles. Later in life she followed a certain Hippostratus to Thessaly, where she was stoned to death by women in the temple of Aphrodite. But it is impossible to sift the really historic from mere anecdotal tradition in the accounts of these women which have come down to us. Consult: Jacobs, ‘Lais, die ältere und die jüngere’ (1830); Wieland, ‘Aristipp.’

Laity (Gr. *λαὸς*, the people). Those members of the church who are not included in the clergy. In the Roman Catholic Church the clergy are divided into eight orders: bishop, priest, deacon, sub-deacon, acolyte, exorcist, ostiarius, lector. By some authorities the episcopate and the priesthood are considered different degrees of the same order, and the lowest of the eight orders is said to belong to all who aspire to the priesthood, postulants or candidates, who are styled clerics. The Protestant Episcopal Church holds, as the prayer-book says, «that from the Apostles' time there have been three orders of ministers in Christ's Church, Bishops, Priests and Deacons.» This does not deny the historic existence of other orders, and may be thought simply to interpret the sentence with which the pastoral letter of the first council of Jerusalem opens (Acts xv. 23): «The Apostles and Presbyters and brethren send greeting,» the brethren being the laity. See CLERGY.

Lake (Lat. *lacus*), a body of water surrounded by land. Lakes are of two kinds — fresh-water and saline — and have been formed in various ways. Taking first the *fresh-water lakes,* these may be grouped as follows: (1) *Obstruction Lakes.*— Some of these are more or less temporary sheets of water, such as the lake-like expansions of certain rivers, and the deserted loops of river-channels. Other temporary lakes are due to the operations of the beaver; to the choking of the narrower passages of a river-channel by drifted vegetable debris or river-ice; or to the advance of a glacier across the mouth of a lateral valley. (2) *Crater Lakes.*— These occupy the craters of extinct or quiescent volcanoes. (3) *Sink Lakes.* — These lie in hollows caused by subsidence of the surface consequent upon the removal of underlying soluble rocks, such as rock-salt, and calcareous and gypseous rocks. (4) *Earth-movement Lakes.*— Unequal movements or warping of the earth's crust have occasionally originated hollows by direct subsidence. It is possible also that local elevation by affecting the lower ends of valleys may sometimes have obstructed the flow of rivers, and thus given rise to lakes. (5) *Glacial Lakes.*— These consist of (*a*) hollows of erosion or *rock-basins,* which have been excavated by glacier-ice, and (*b*) hollows caused by the unequal distribution or accumulation of glacial detritus during the glacial period. (6) *Subterranean Lakes.*— These are found chiefly in calcareous regions, where they occupy the underground channels which have been excavated by the chemical and mechanical action of water. *Fresh-water* lakes are very unequally distributed. They are most numerous in those regions which were overflowed by land-ice during the glacial period, as in the British Islands, Scandinavia, Finland, Canada, and the United States. Lakes occur at all heights above the sea; the most elevated being Lake Tsana in Abyssinia (7,500 feet), Lake Titicaca in the Bolivian Andes (12,500 feet, and Askal Chin in Tibet (16,600 feet). The largest lake in the world is Lake Superior, which covers an area of 31,200 square miles, and has a mean depth of about 475 feet. Lake Baikal, in central Asia, is the largest and deepest mountain lake, its area being 13,500 square miles, and its mean depth 850 feet, but in places it reaches a depth of more than 4,000 feet. Some of the mountain lakes of Europe also attain great depths; thus, Lake Geneva is 1,000 feet, Lago Maggiore 1,158 feet, and Como 1,358 feet.

Salt Lakes.— Two kinds are recognized: (*a*) portions of the sea cut off from the general oceanic area by epigene or hypogene agencies; (*b*) lakes, originally fresh-water, which have been rendered saline by evaporation and concentration. Those of the first group range in size from mere pools and lagoons up to inland seas, such as those of the great Aralo-Caspian depression. The Dead Sea and the Great Salt Lake of Utah are good examples of the second group of saline lakes, which might be defined shortly as lakes which have no outlet to the ocean. The Caspian Sea is 97 feet below the level of the Black Sea, has an area of about 170,000 square miles, and is from 2,500 to 3,000 feet deep in the deepest parts. A still more depressed area is that of the Dead Sea, the surface of which is 1,292 feet below the level of the Mediterranean Sea.

Lake. Pigments consisting of coloring matter combined with a metallic oxide are called *lakes.* They are obtained by mixing with the solution of the coloring matter a solution of alum or of a salt of tin, tungsten, zinc, or other metal, and then adding an alkali or alkaline carbonate. The precipitate which forms consists of the color combined with the oxide. Among the pigments prepared in this way may be mentioned *blue* lake, consisting of cobalt blue, indigo, or ultramarine and alumina; *madder* lake, of madder and alumina; *orange* lake, of turmeric and alumina; *carmine* lake, of cochineal and alumina, which is the finest and most important of all; *purple* lake, of logwood and alumina; and so on. The exact tint depends on the proportions of the ingredients and the mode of preparation, as the lakes do not appear to be definite compounds. Lake pigments are largely used not only in painting, but also in calico-printing, but in the latter the metallic oxide is put upon the cloth, and the color is afterward applied.

Lake Agassiz, ăg'ạ-sĭ, a glacial lake once covering a large area in the Red River Valley of Minnesota, North Dakota and Canada. The lake during its existence was larger than all the Great Lakes combined. The bed of this extinct lake is now a great plain, covered with till and silt, yielding its soil to the growth of wheat and other grain. Consult Upham, ‹The Glacial Lake Agassiz› (1895). See also GLACIAL PERIOD.

Lake Bonneville, bon'vĭl. See GREAT SALT LAKE.

Lake Carp, a fish, *Carpiodes Thompsoni,* one of the carp-suckers (q.v.), inhabiting the Great Lakes.

Lake Charles, La., city and parish-seat of Calcasieu Parish, on the Calcasieu River, and Southern P. railroad, 216 miles west of New Orleans. Located on the banks of the picturesque Lake Charles it is one of the most attractive cities in the State. It has Acadia College, the Carnegie Library, Parish court house, high school and numerous churches. It was settled in 1849 and was first incorporated in 1860. Under a new charter of 1886, the city is governed by a mayor and common council, elected every two years. There are extensive cotton and rice mills here and a large trade in lumber. Pop. (1890) 3,442; (1900) 6,680.

Lake City, Fla., town and county-seat of Columbia County, on the Southern, the Florida C. and other railroads; 60 miles west of Jacksonville. Here is located the State Agricultural College and an agricultural experiment station. In 1901 the State legislature granted the town a new charter greatly enlarging its limits. The town has an important trade in cotton, lumber, turpentine, fruit, etc. Pop. (1890) 2,200; (1900) 4,013; (1902) 6,000.

Lake City, Minn., city in Wabasha County, on Lake Pepin and on the Chicago, M. & St. P. railroad, 57 miles southeast of St. Paul. It has a public library and high school, and numerous manufactures, including grain elevators, flour mills, wagon and carriage factories, foundries, machine shops, and an extensive nursery covering 1,400 acres. The city is governed by a mayor and council, and owns the waterworks and electric light plant. Pop. (1890) 2,128; (1900) 2,744.

Lake Cusk, or **Lake Lawyer,** the American cusk. See CUSK.

Lake Dwellings are those constructed on artificial or partly artificial islands in lakes. The use of habitations of this nature is a subject which has engaged the attention of archæologists and others very largely since the discovery of the remains of a lake dwelling in Ireland in 1839, of similar ones in Switzerland in 1854, and subsequently of numbers of others elsewhere. The archæological interest thus attaching to these remains has drawn attention to similar dwellings being still used in various parts of the world, in Russia, the Malay Archipelago, Venezuela, New Zealand, and in a modified form in some parts of Central Africa. The first who is known to have described lake dwellings is Herodotus, who mentions that the Persians in their invasion of Thrace and Macedonia in the beginning of the 5th century B.C. found certain tribes inhabiting Lake Prasias, whose dwellings were constructed on platforms supported above the surface of the lake by piles driven into its bottom.

The lake dwellings are built after two chief types, one of which has an Irish name, *crannogs,* given to it, from the fact that those of this type are chiefly found in Ireland; and the other of which has a German name, *Pfahlbauten,* because those of this type were first found in Switzerland. Crannogs are made in the following way: Great quantities of small stems, sticks, and the like, are collected and sunk by means of stones in the lake, so as to form an island. Very often advantage is taken of the existence of an island just level with the surface of the water, which can be raised a foot or two above the surface with comparatively little labor. Sometimes a few upright piles are driven in on the top after the chief part of the island has been made in the manner described. When the island is thus raised to a sufficient height it is frequently strengthened by an enclosure of stakes driven into the bottom of the lake perpendicularly. A platform of thin stems of trees, either round or split into boards, is then made on top of the island, and this supports the structures that are built on them. The crannogs of Ireland appear to have been rather used as strongholds than as dwellings.

Pfahlbauten or pile dwellings are made by driving piles into the lake bottom as a support for the platforms on which the dwellings are erected. The piles are sharpened at the lower end, and an examination shows the sharpening to have been performed partly by heat and partly by some cutting instrument, either of stone, bronze, or iron, as is proved by the fact of such instruments frequently being found on the dwellings. Greater solidity and compactness is sometimes given to the structure of vertical piles by means of stakes transversely inserted between them or notched on to them just below the top. In other cases heaps of stones are thrown down between the upright stakes, forming what is called in Germany a *Steinberg.* The upper ends of the vertical piles are brought to an exact level to allow a platform to rest on them similar to that of a crannog. Coarse gravel was frequently strewed over the platform to keep it dry, and the interstices were often filled up with mud. It was also common to make a hurdle wall round the whole artificial island by means of small branches and twigs interwoven between the outermost stakes. Huts were built on the platform in a similar manner to the rest of the structure. The walls were of stakes bound together by wattles, and covered over by a thick clay, and the roofs were probably thatched. A single platform was in many cases large enough to support a considerable number of huts. Among works on the subject consult: Munro, ‹Ancient Scottish Lake-dwellings› (1882); Wood Martin, ‹Lake-dwellings of Ireland› (1886); and Munro, ‹Lake-dwellings of Europe› (1890).

Lake Forest, Ill., city in Lake County, on Lake Michigan, and on the Chicago & N. W. railroad, 28 miles north of Chicago. It is a suburban and residential town without industries or manufactories. There is here a seminary for young ladies, a public library, an academy for boys and Lake Forest University (q.v.). It was settled in 1859, and is governed by a mayor and council elected every two years. Pop. (1890) 1,200; (1900) 2,215.

Lake Forest College, a school for both sexes at Lake Forest, Ill. The history of the institution shows that in 1855 a number of citizens of Chicago, under the leadership of the Rev. Robert W. Patterson, formed an association for the purpose of establishing an educational institution near Chicago which, despite its proximity to the city, would always retain the advantages of a rural situation. In February 1856 the Lake Forest Association was organized, and the 1,300 acres of land along the shore of Lake Michigan, 28 miles from Chicago, were purchased by the association, which is now the site of the town of Lake Forest. Half of the land was to be association property, every alternate lot being set aside for the university, and 62 acres being left for an «inalienable campus.» The educational institution was chartered on 13 Feb. 1857, under the title Lind University. This name was changed in 1865 to Lake Forest University. The boys' department was opened first, and through the bequest of $35,000 from the Rev. W. W. Ferry the school for girls was founded 11 years later. The college department, known as Lake Forest College, was opened in September 1876. The institution was founded by Presbyterians, but it is not denominational in its character. It has 127 professors, 1,400 students, 21,000 volumes in the library, and an income of $120,000; productive funds $500,000; value of grounds and buildings $700,000. Lake Forest College is also attracting favorable notice from the literary world, owing to the fact that it has received a large endowment for a prize, a library and a lectureship, which, it is believed, will attract as much attention in the United States as the famous Bampton and Gifford lectures have done in Great Britain.

Lake of the Four Forest Cantons, a common name for the Lake of Lucerne. The city of Lucerne, and the towns of Küsnacht, Brunnen, and Flüelen are on its shores.

Lake Geneva, jĕ-nē'vạ, Wis., city in Walworth County, on the Chicago & N. W. railroad, 70 miles northwest of Chicago. Situated on Lake Geneva, the city has developed into a popular summer resort. The lake is 9 miles long and from 1 to 3 miles in width, and is fed entirely by springs. The Yerkes Observatory, belonging to the University of Chicago, is located here. There are numerous large hotels, churches, schools, a public library and other buildings. The city was incorporated in 1893 and is governed by a mayor and council elected annually. Pop. (1890) 2,290; (1900) 2,600.

Lake Herring, or **Lake Whiting,** a local name for certain whitefish of the Great Lakes, especially the cisco (q.v.).

Lake Lahon'tan, an extinct lake which once existed in the western part of Nevada. The pebbly beaches, and other shore-line marks are still quite distinct. It, like Lake Bonneville, in Utah, belonged to the glacial period, when what is known now as the Great Basin had much larger bodies of water than exist now in the same section. The place occupied by

Lake Lahontan is at present a saline waste, with here and there small salt lakes. Consult: U. S. Geological Survey, Monograph 11 (1885); Russell, 'Geological History of Lake Lahontan.'

Lake School, or **Lakists,** a name formerly given to certain British poets who came forward conspicuously at the beginning of the 19th century, and endeavored to substitute a natural and simple taste for the classicism of which Addison and Pope furnish leading examples. They received their name from the picturesque lakes of Cumberland and Westmoreland, where Wordsworth, Coleridge, Southey, Wilson, and others, had fixed their residence permanently or for a time.

Lake Silversides. See SILVERSIDES.

Lake State, The, a popular name given to Michigan. Its shores are watered by Lakes Superior, Michigan, Huron, and Erie. The Indian word Michigan signifies «great lake.»

Lake Sturgeon, the great sturgeon (*Accipenser rubicundus*) of the Great Lake region. See STURGEON.

Lake Trout, two salmonoid fishes of the genus *Cristivomer* inhabiting lakes in the northern United States and southern Canada, (1) the Great Lake trout (*C. namaycush*); and (2) the siscowet (*C. siscowet*). The former, and more important, occurs in most of the larger lakes and ponds from New Brunswick to Idaho and Vancouver Island, and throughout northern Canada and Alaska. The Canadians call it namaycush, and by other Indian names; in Maine and Vermont it is known as «togue» and «longe» respectively; and on the upper Great Lakes as Mackinaw trout. It is the largest of the trout family, sometimes exceeding 100 pounds in weight, but the average specimen weighs from 15 to 20 pounds; the biggest fish are found in the largest and deepest lakes. It is trout-like in form, thin-skinned, with little or no underlying fatty tissue, and dark gray spotted with round paler spots sometimes of a slightly reddish tinge. It is fierce and voracious, seizing and feeding upon «all fishes with soft fins» and anything else edible that falls in its way; and when mature it can hold its own against any other depredator, so that it may be regarded as ruler of the lakes. It spawns on the reefs in the late autumn, but otherwise dwells in the deeper waters; Jordan says that the usual number of eggs deposited at one spawning is only 5,000 or 6,000. As a game-fish it seems variable, in some waters affording good sport by trolling with a spoon-bait or live minnow, and in others having small repute among anglers. All agree, however, as to the excellence of its flesh on the table; and it furnishes a commercial fishery on the Great Lakes only excelled in importance by that for whitefish. These trout are usually caught by vast gill-nets operated by steam vessels, and three or four tons are sometimes taken in a single haul. About 1885 the supply in the Great Lakes was diminished to an alarming extent; but artificial propagation by the State and National governments soon restored the quantity, so that at the beginning of the present century more could be taken by fishermen than could profitably be sold. It is outranked in market-price and demand, however, by the whitefish.

The siscowet is very similar, but has a deeper body, thicker skin, beneath which is an excessive development of fatty tissue, and paler coloration. It is rarely seen outside of Lake Superior, where it is numerous in deep water. Consult: Goode, 'American Fishes' (1888); Jordan and Evermann, 'American Food and Game Fishes' (1902); Sage and Cheney, 'Salmon Trout' (1902).

Lake of the Woods, a boundary lake, partly in the Province of Ontario, Canada, and partly within the State of Minnesota, 220 miles west of Lake Superior, and 377 feet above its level. It is broken by one long promontory and several smaller ones into distinct portions, of which only the southern, containing Big Island, is properly designated the Lake of the Woods, while the eastern bears the name of White Fish Bay, the northern, which is studded with islands, being called Clear Water Lake, and the northwestern, Shoal Lake. The whole expanse of water forms a single lake of very irregular shape about 70 miles in length and 60 in breadth, the water area being about 1,500 square miles. Rainy River, the principal feeder of the lake, enters it at its southeastern extremity, just below Fort Louise; its discharge is at the north by the Winnipeg. It abounds with sturgeon. The boundary between Canada and the United States follows the Rainy River to its mouth in the lake, and then proceeds across the lake in such a way as to leave Big Island to Canada, whilst giving most of the Lake of the Woods proper to Minnesota. A little west of the meridian of 95° the boundary strikes due south to meet the parallel of 49°, which is then followed, the result being that the United States owns an isolated portion of the land on the northwest shore. There are gold mines in the neighborhood.

Lake-to-Sea Commission. In 1903 President Roosevelt appointed three commissioners to act in behalf of the United States in co-operation with a similar body representing Great Britain, to investigate the question of water routes from the Great Lakes to the Atlantic Ocean. The authority for the President's action is contained in the River and Harbor bill. The commissioners are particularly required «to report upon the advisability of locating a dam at the outlet of Lake Erie.» The project which this commission is charged to examine is so vast, not only in its bearing upon the inland commerce of the North American continent, but in its possible effect upon the political relations between the United States and Canada, that its serious consideration by a body of official experts representing the two governments directly concerned becomes a matter of international interest. The idea of an international commission to inquire and report upon the effect of the diversion of the waters of the Great Lakes originated several years since with the Hon. Andrew H. Green of New York, who for nearly 20 years from its organization was a member of a Commission of the State Reservation at Niagara Falls.

Lake'wood, N. J., township and village of the same name in Ocean County; the town is a famous health and winter resort, surrounded by an extensive pine forest, in which are numerous lakes. Here are numbers of large hotels and many cottages owned by residents of New York and Philadelphia. Known for more than a score of years to a few, discovered and originally promoted by men who found here the conditions which were a necessity of long life, and developed and made successful by the presence of manifold advantages, Lakewood is known on both sides of the ocean, among the most critical and intelligent travelers from Canada to the Gulf and from the Atlantic to the Golden Gate, in Europe and on the Continent, as the most popular resort in America's Middle East. Lakewood has grown steadily in its normal population, as well as its taxable inventory. Its streets and avenues, carefully laid out and well built of stone, are kept in perfect repair during the season, and afford one of the chief charms of the place in an almost endless variety of drives. The lakes of the place, among its great charms, are protected carefully from contamination, and at once furnish an adequate water supply for fire purposes, are points of much attraction at the infrequent times when skating is available, and throughout the season a picturesque viewpoint, admired by thousands. Pop. (1900) 3,094.

Lakey, Emily Jane, American artist: b. Quincy, N. Y., 22 June 1837; d. Cranford, N. J., 24 Oct. 1896. She received her art education at the National Academy of Design in 1873 and in Paris, and made a specialty of cattle pieces. Among her paintings of this character are: 'The Leader of the Herd'; 'An Anxious Mother'; 'The Right of Way'; 'From Pasture to Pool.'

Lakshmi, lăksh'mē (Prosperity), in Hindu mythology, the wife of Vishnu and the goddess of fortune. She is the female or creative energy of Vishnu, and hence is in many cases regarded as an expression of the attributes of Vishnu. She is said to have been produced from the ocean of milk when churned by the gods to obtain the beverage of immortality. She was thus born in the full flush of beauty, adorned with a diadem, and with gems on her neck and arms, bearing in her hand a lotus. As soon as she was born she betook herself to the bosom of Vishnu, to whom she was ever faithful. According to a later view, that of the worshippers of Vishnu, this god produced three goddesses, Brâhmî, Lakshmî, and Chandika, the first his creative, the second his preserving, and the third his destroying energy.

Lala, Ramon Reyes, American author: b. Manila, Philippine Islands, 1 March 1857. He was educated in Hong Kong, London, and Switzerland, and after traveling extensively, returned to Manila and engaged in business. By reason of Spanish oppression he came to the United States, and was the first Filipino ever naturalized here. He became widely known in the United States as a lecturer on his native country and has published 'The Philippine Islands' (1898), and many magazine articles on allied topics.

Lalande, Joseph Jérome le Français de, zhō-zĕf zhā-rōm lė frän-sā dė lä-länd, French astronomer: b. Bourg-en-Bresse, Ain, 11 July 1732; d. Paris 4 April 1807. He devoted himself to mathematics and astronomy, and was sent by the Academy in 1751 to Berlin to determine the parallax of the moon, while Lacaille went with the same object to the Cape of Good Hope. After having finished his operations at Berlin, he was chosen member of the Academy of Sciences in Paris in the year 1753. Thenceforward no volume of their 'Transactions' appeared which did not contain some important communications from him. In 1762 he was appointed professor of astronomy in the Collège de France, where he lectured with great success to the end of his life. His chief works are his 'Treatise on Astronomy' (1764); 'History, Theory, and Practice of Navigation'; and 'Astronomical Bibliography.' He wrote all the astronomical articles for the great 'Encyclopédie,' and re-wrote them for the 'Encyclopédie Méthodique,' and contributed to various scientific periodicals, besides editing the 'Connaissance des Temps' from 1760 to 1775, and from 1794 till his death.

Lalande's Dog. See Cape Fox.

Lalemant, läl-mäṅ, **Gabriel,** French Jesuit missionary in America: b. Paris 1610; d. Huron mission, New France, 1649. He was a nephew of Jérôme Lalemant (q.v.). In 1630 he entered the Jesuit Order, in 1646 went to New France, and was appointed to the mission among the Hurons. During the fatal invasion of the Huron country by the Iroquois he was taken prisoner, tortured, and killed.

Lalemant, Jerôme, zhā-rōm, French Jesuit missionary in America: b. France 1593; d. New France 1673. In 1609 (or 1610) he entered the Jesuit Order, then taught in educational institutions of the order, and in 1638–45 was superior of Huron Jesuit mission in New France. In 1645–50 he was superior of all the missions at New France. After a sojourn in France (1650–9), he returned to America to resume his post. Letters and reports by him appear in the great compilation of the 'Jesuit Relations' (1896–1901). Consult also Parkman, 'The Jesuits in North America' (new ed. 1898).

Lalita-Vistara, lă-lĭ-tạ-vĭs'tạ-rạ, one of the most celebrated works of Buddhistic literature, of unknown origin and antiquity, existing only in a Sanskrit version. It contains a narrative of the life and doctrine of the Buddha Sakyamuni, and is considered by the Buddhists as one of their chief works treating of religious law.

Lalla Rookh, läl'ạ-rook, the greatest and most complete of all the poetic works of Thomas Moore. It consists of four narratives, of which 'Paradise and the Peri' is the finest and most popular. The scene is laid in the Far East, and the learning and ingenuity of the poet, as well as his brilliant imagery and musical versification combine to produce an oriental romance unequaled in the English language. The four stories are told to Lalla Rookh by her lover who attends her on a journey in the disguise of a minstrel. 'Lalla Rookh' was first published in 1817.

L'Allegro, läl-lā'grō, the title of a famous lyrical poem by John Milton, written about 1632.

Lally-Tollendal, lā-lē-tŏ-lŏṅ-däl, **Thomas Arthur,** Comte: b. Romans Dauphiné 1702; d. 9 May 1766. He was of Irish parentage, his father having followed the fortunes of James II. Trained to arms, he was made brigadier on the field of Fontenoy for distinguished bravery. He accompanied the Pretender to Scotland in 1745, and in 1756 was selected to restore the French influence in India, for which purpose he was made governor of Pondicherry. He failed in this, surrendered Pondicherry in 1761, and was brought prisoner to England. The following month he was allowed to return to France, where, after a long imprisonment, he was condemned and executed (1766) for treachery, etc. His son (Trophime Gerard, 1751–1830), supported by Voltaire, obtained in 1778 a complete authoritative vindication of his father's conduct.

Lamaism, lā'mạ-ĭzm, an Asiatic religious belief, which is a mixture of Buddhism (see BUDDHA), Sivaism (see SIVA) and Shamanism (q.v.). It prevails from the borders of Tibet to the banks of the Volga. It is the religion of Manchuria, Mongolia and Siberia, and is found in various localities in China proper. Its adherents number more than 10,000,000.

History.— Lamaism was not known in Tibet before the 7th century A.D., when two Buddhist princesses, one from India, the other from China, shared the throne of King Sron Tsan, who adopted their religious belief. One of his successors, Thi Sron Detsan, invited Padma-Sambhava, a Buddhist monk, to preach the doctrine of the «Enlightened One» throughout the kingdom. Padma-Sambhava accordingly set about with royal authority to check witchcraft and devil worship. He established, moreover, an order of Lama priests. Lamaism, however, did not reach its culmination of power until Nag-wan Lozang, the fifth Grand Lama, was in 1640 made Dalai Lama (Ocean wide Lama), and united the authority of church and state in one individual. The modern period of this Asiatic cult dates from this epoch.

Doctrine and Religious Belief.— When Padma-Sambhava first preached Buddhism to the Tibetans he took great pains to adapt it to the capacity of his hearers, and even to their prejudices. He therefore accepted their assent or conformity as sufficient evidence of their belief. It was impossible to drive out their ancestral mysticism, practice of magic, and devil worship, and all of these continued to form elements in Lamaism. In this system the cosmogony of Buddhism is preserved intact with the Buddhistic conception of heaven and hell, and the Buddhistic canon of morality, and, like the system of the «Enlightened One,» Lamaism knows no worship but that of saints. Its essential creed comprises «the three most precious jewels,» namely, «the Buddha-jewel,» the «doctrine-jewel,» and the «priesthood-jewel.» Buddha is not god nor creator; but merely the founder of a doctrine, saintly, preeminently wise, powerful, virtuous and beautiful. The doctrine is the embodiment or incarnation of Buddha, all that remained of him on earth after his absorption in Nirvana. The priesthood comprises the incarnate and non-incarnate saints, among whom are the five Buddhas of Contemplation, and myriads of solitaries who attain perfection without Buddha, besides men of supreme holiness, destined to be canonized after death. In an inferior position to these saints stand spirits, whose kings are Indra (q.v.), god of the firmament; Yama (q.v.), god of death and hell; Yamantaka or Siva as the avenger; Vaisravana (q.v.), god of wealth; besides numerous guardian and other demons who receive worship. The worship of Lamaism is conducted with prayer, reading, hymn-singing, accompanied with loud music. The clergy are summoned by the sound of a bell; the shrines and altars are brightly adorned on festivals, and offerings are made of tea, flour and milk, etc., offerings of flesh being forbidden. Rosaries, prayer wheels, amulets, charms and symbols are employed by the priests, while sometimes a part of public worship is taken up with rites of magic; charms are recited, spells are cast, incantations made, while the worshippers consult those who are reputed to be diviners, necromancers, or astrologers.

Religious Festivals.— The three principal are the New Year, in February, when the return of spring is celebrated as the triumph of Buddha, the «Enlightened One,» over six heretical teachers. The second festival is held in commemoration of the incarnation of Buddha and marks the day of his mundane conception; it is the most ancient of these holy days. Third in order comes the Water Festival, marking the approach of autumn and the fall of fertilizing rain.

Religious Rites.— The two principal rites in Lamaism are baptism, and admission to discipleship, the former administered the 3d or 10th day after birth; the latter, as soon as the child can walk and speak. Marriage is a civil contract, but the lama fixes the day, and is feed accordingly; he also receives gifts for rescuing the dead from Yama by religious rites and incantations. It is the lama or priest that attends the dying man or woman, to see that dissolution between body and soul is properly accomplished, and to guide the soul to the western paradise.

Hierarchy.— There are two hierarchs, or spiritual heads, to the followers of Lamaism, Dalai-Lama (Ocean wide Lama), whose seat is at the hill of Potala, near Lhasa, who is really the head and chief of the hierarchy, and all Lamaists in Tibet, Mongolia and China are his children and subjects; the other is Teush-Lama. His official title is «the great teacher-jewel.» There are two ranks below these. These orders are supposed to be the reincarnations of the Buddhist saints. The subject of reincarnation plays a prominent part in Lamaism. When the Grand Lama dies his soul is reborn in some child whose birth is coincident in time with his death. Who this child may be out of the many born at that moment used to be decided by lot, unless the deceased had announced before his death the name of the family in which he was about to reappear. At present the emperor of China has great influence in deciding the point.

There are four orders of inferior clergy who generally live in lamaseries or convents and make no claim to be reincarnations of the saints. The lamasery consists of a central temple surrounded by buildings — cells, library, refectory, etc. There are nunneries also where women live in prayer, study and celibacy, but these are few in number.

The Scriptures.— The sacred books are very numerous and make up from 222 to 228 volumes. First is the canon, a collection of the commands or sayings of Buddha. Second is the commentary. The canon contains 1,083 works, which fill more than 100 volumes of 1,000 pages each. It comprises the following subjects: (1) Discipline, (2) Sermons, or homilies of the various Buddhas, (3) Philosophy and metaphysics. There are also treatises on Nirvana (q.v.), ethics, ritual, etc. Consult: Rockhill, ‘The Life of Buddha, and the Early History of his Order’ (1884); Köppen, ‘Die lamaische Hierarchie und Kirche’ (1859); Waddell, ‘The Buddhism of Tibet’ (1895).

Lamar, lä-mär′, or **Lamar y Cortezar**, lä-mär′ ē kōr-tā-thär′, **José**, hō-sā′, Spanish-American general: b. Cuenca, Ecuador, 1778; d. San Jose, Costa Rica, 11 Oct. 1830. He went to Spain in his youth, and entering the army there fought against the French at Saragossa. He was ordered to Peru in 1815, and was governor of Callao Castle at the time of its surrender, 21 Sept. 1821. He then joined the revolutionists and in 1824 became marshal. He was elected president of Peru in 1827, caused the deposition of Sucre, president of Bolivia; provoked a war with Colombia, in which he was defeated, and on 29 June 1829 was deposed by his own officers and exiled.

Lamar, Lucius Quintus Cincinnatus, American jurist: b. Eatonton, Putnam County, Ga., 1 Sept. 1825; d. Macon, Ga., 23 Jan. 1893. He was graduated from Emory College (Oxford, Ga.), studied law at Macon, was admitted to the bar in 1847; removed in 1849 to Oxford, Miss., was there professor of mathematics in the University of Mississippi (1850–2), in 1852–5 practised at Covington, Ga., was elected to the Georgia legislature in 1853, and having returned in 1855 to Mississippi, was there elected representative in Congress in 1857 and 1859. In 1860 he resigned his seat in Congress; drafted Mississippi's ordinance of secession; and was a member of the State convention that passed it (9 Jan. 1861). Chosen lieutenant-colonel of the first Confederate regiment organized in Mississippi, he resigned from military service in October 1862, and in 1863–4 was in Europe, whither he had gone as commissioner to Russia, though he did not proceed to his post. After the war he held the chairs of ethics and metaphysics (1866–7) and of law (1867–70) in the University of Mississippi; was a representative in Congress (1873–7) and a United States senator (1877–85); and secretary of the Interior (1885–8). From 1888 he was an associate justice of the United States Supreme Court. On 27 April 1874 he pronounced before the House a eulogy on Charles Sumner, highly praised for its eloquence and generally for its liberal tone, but so displeasing in that respect to many of his constituency that they endeavored to defeat his re-election. His strong opposition to the debasement or inflation of the national currency caused the Mississippi legislature formally to direct him to renounce either his views or his seat in the Senate, both of which he declined to do. He was re-elected to the Senate by an increased majority. His oration at the dedication of the monument to John C. Calhoun at Charleston, S. C. (1887), was one of the best of his public addresses. Consult the study by Mayes, including Lamar's speeches (1896).

Lamar, lạ-mär′, **Mirabeau Buonaparte**, American politician, second president of the republic of Texas: b. Louisville, Ga., 16 Aug. 1798; d. Richmond, Texas, 19 Dec. 1859. After being employed a number of years in mercantile business and farming, he established in 1828 the ‘Columbus Inquirer,’ a journal devoted to the defense of State rights, and was actively engaged in politics until his removal in 1835 to Texas. Arriving there at the outbreak of the revolution, he at once sided with the party in favor of independence, and participated in the battle of San Jacinto, to the successful issue of which the charge of the cavalry under his command greatly contributed. He was soon after called into the cabinet as attorney-general, a position which he subsequently exchanged for that of secretary of war. In 1836 he was elected the first vice-president of Texas, having for some months previous held the rank of major-general in the army. In 1838 he was elected president, in which office he remained until 1841. Upon the breaking out of war between Mexico and the United States in 1846, he joined Gen. Taylor at Matamoras, and fought at the battle of Monterey. He subsequently stationed himself with an armed force at Laredo, where for two years he was engaged in constant conflicts with the Comanches, whose depredations on the frontier he greatly curtailed. The last public position which he held was that of United States minister to Nicaragua and Costa Rica, from which he had but lately returned when he died. He published ‘Verse Memorials’ (1857).

Lamar, William Bailey, American politician: b. Jefferson County, Fla., 12 June 1853. He was educated at the University of Georgia and was graduated from the Lebanon Law School, Tenn., in 1875. He was admitted to the bar in that year, practised in Tupelo, Miss., 1875–6, and then returning to Florida was clerk of the circuit court of his native county 1877–81, and county judge 1883–6. He entered the Florida legislature in 1886, was attorney-general of his State 1888–1902, and became a member of Congress from the 3d Florida district in 1903.

Lamar, Mo., city and county-seat of Barton County, on the Spring River and the Missouri P. and the Kansas City, Ft. S. & M. R.R.'s; 39 miles north of Joplin. Lamar College is located here. The city has extensive coal mining and lumbering interests and is the centre of a large agricultural district. It has a large flour trade. Pop. (1890) 2,860; (1900) 2,737.

Lamarck, Jean Baptiste Pierre Antoine de Monet, Chevalier de, French scientist: b. Bazentin, Picardy, 1 Aug. 1744; d. Paris 18 Dec. 1829. He was of noble family, entered the army in 1760, but was compelled on account of an accident, to abandon active military service, after which he devoted his attention to study, first to medicine; afterward, after hearing Jussieu's illustrations of botany, he turned to the study of that science. Jussieu had intimated that the old method of classification in botany was defective and Lamarck determined to remedy the deficiency. He labored with great diligence on a treatise in which he showed the defects of the old classification, and proposed a new one, which met with general approval. He then applied his new system to the plants of France, and delivered to the Academy his ‘Flore

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Française, ou Description succincte de toutes les Plantes qui croissent naturellement en France.’ This work was printed, by the recommendation of the Academy, at the expense of the government, for the benefit of the author (1780). Lamarck now turned his whole attention to botanical research, and made several excursions to Auvergne, and into Germany, in the last of which he was accompanied by the son of Buffon. On his return to Paris he undertook the botanical department of the encyclopædia which Panckoucke was publishing, and applied himself to this task with such assiduity that, in 1783, he produced the first half of the first volume, with an introduction, containing a sketch of the history of the science. He published the second volume in 1788. But a dispute between him and the publisher brought the undertaking to a stand, and ended Lamarck's botanical career. At the breaking out of the Revolution he was the second professor in the royal Jardin des Plantes, but in consequence of new arrangements he received a chair in the department of zoology, in which he was soon as much distinguished as he had been in botany. In his writings he shows himself a real forerunner of Darwin. Lamarck's comprehensive mind was also directed toward physics, and he published in 1794 ‘Recherches sur les Causes des Principaux Faits Physiques,’ in which he exposes many false theories. With the same view he also wrote his ‘Refutation de la Theorie Pneumatique,’ etc., which appeared in Paris in 1796.

The most permanently important work of Lamarck is his ‘Philosophie Zoologique,’ although at the time it was published, it excited little attention. He was doubtless familiar with Erasmus Darwin's ‘Love of the Plants,’ which in spite of its many absurdities contained some premonitions of the great discoveries to be made by the author's greater grandson. The essence of Lamarck's theory may be stated in the following propositions: (1) Every considerable and sustained change in the conditions of life produces a real change in the needs of the animals involved; (2) change of needs involves new habits; (3) altered function evokes change of structure, for parts formerly less used become with increased exercise more highly developed, other organs in default of use deteriorate and finally disappear, while new parts gradually arise in the organism by its own efforts from within (*efforts de son sentiment intérieur*); (4) gains or losses due to use or disuse are transmitted from parents to offspring. The main point is of course contained in the last proposition, which is controverted by Darwin and Weismann, and their adherents in England and Germany. There is, however, a Lamarckian school of considerable influence in Paris, and the Neo-Lamarckians of the United States, including Cope, Hyatt and Packard, have much to support their «laws of growth» as involving the inherited effects of use, disuse and new environments. See DARWIN; EVOLUTION; HEREDITY.

Consult: Butler, ‘Evolution, New and Old’ (1879); Claus, ‘Lamarck als Begründer der Descendenztheorie’ (1888); Haeckel, ‘Die Naturanschauung von Darwin, Goethe und Lamarck’ (1882).

Lamarckism, la-mär'kĭzm. The theory of organic evolution which, in brief, accounts for the origin of life-forms by change of environment, the exercise or use, and the disuse of organs, and the transmission of characteristics acquired during the life-time of the individual. It differs from Darwinism in lacking the principle of natural selection.

History of the Rise of the Theory.— Lamarck in 1801, after 25 years' experience as a botanist, and when as a systematic zoologist he had devoted 10 years of labor in classifying the invertebrate animals of the Paris Museum, then the most extensive zoological collection in the world, published a lecture, delivered in 1800, in which he claimed that time without limit and favorable conditions of life are the two principal means or factors in the production of plants and animals. Under the head of favorable conditions he enumerates variations in climate, temperature, change of habits, variation in means of living, of preservation of life, of means of defense, and varying modes of reproduction. As the result of the action of these different agencies or factors, the faculties of animals, developed and strengthened by use, become diversified by the new habits, so that by slow degrees the new structures and organs thus arising become preserved and transmitted by heredity. Although Lamarck did not discover the principle of natural selection, he recognized the fact of competition, of a struggle for existence, but did not dwell on them to the extent that Darwin and later observers did. In 1802, 1803, and 1806 he reiterated and somewhat extended these views, which were published in final form in 1809, in his ‘Philosophie Zoologique,’ and again in 1815, in the introduction to his ‘Animaux sans Vertèbres.’ By this time Lamarck had become the greatest zoologist of the period between Linné and Cuvier. He was expert in detecting the limits between species, and has given us the best definition extant of a species.

Lamarck's Factors of Organic Evolution.— These in their essential form are contained in his famous two laws:

First Law.— In every animal which has not exceeded the term of its development, the more frequent and sustained use of any organ gradually strengthens this organ, develops and enlarges it, and gives it a strength proportioned to the length of time of such use; while the constant lack of use of such an organ imperceptibly weakens it, causes it to become reduced, progressively diminishes its faculties, and ends in its disappearance.

Second Law.— Everything which nature has caused individuals to acquire or lose by the influence of the circumstances to which their race may be for a long time exposed, and consequently by the influence of the predominant use of such an organ, or by that of the constant lack of use of such part, it preserves by heredity (*génération*) and passes on to the new individuals which descend from it, provided that the changes thus acquired are common to both sexes, or to those which have given origin to these new individuals.

Lamarck also insisted that animals are modified in accordance with the diversity of their surroundings; that local causes, such as differences in soil, climate, etc., give rise to variations and that the whole surface of the earth affords a diversity in localities and habits, one region differing from another, that though the environment remains the same for a long time and species remain constant for that period, yet there is a slow, gradual change, and species are modified in adaptation to such changes. Moreover such changes induce alterations in the wants or needs of animals; this necessitates other movements or actions to satisfy the new needs, and hence they give origin to new habits, and this leads to the use or exercise of some organ or organs in a new direction, with the result that different parts or organs are modified in adaptation to the new surroundings and necessities of existence. All this is perfectly true. We now know that by geographical changes or from lack of food animals are compelled to migrate into new regions, and are there obliged to adopt new habits and become transformed into new species or types. Thus whales have descended from terrestrial forms; the baleen whale has in its embryo stage rudimentary teeth showing that it is a descendant of toothed whales. Lamarck refers to Geoffroy's discovery in embryo birds of the groove where teeth should be situated, and subsequently fossil birds with teeth were unearthed. The mole with its functionless eyes, due to underground life, the blind *Proteus* of Austrian caves, the headless and eyeless bivalve mollusks, these parts lost by disuse; the evolution by atrophy of the limbs of the snake, due to their lack of use in passing through narrow places; wingless insects whose wings have been lost by disuse; the webs between the toes of ducks, geese, as well as those in the feet of the frogs, sea turtles, otter and beaver, are mentioned by Lamarck as examples of the effects of use and exercise. Other examples of use results are the origin of horns in ruminants; the long neck of the giraffe, which by the absence of herbage was obliged to browse on the foliage of trees «and to make continual efforts to reach it,» the shapes of the carnivores, of the kangaroo and of the sloth, which are accounted for by the necessity of their adopting new habits, and, by exercise in new directions, becoming adapted to the new conditions of life. Although Lamarck gave few illustrations, it may be doubted whether any one has since his day more satisfactorily explained the origin of such forms or modifications. Lamarck also accounts for the origin of man, suggesting in a tentative way his rise from an arboreal or ape-like creature, with a detailed hypothesis of the gradual process of his transformation, into a being with an upright posture, an enlarged brain, powers of reason, and other human qualities. But besides these special cases Lamarck was broad and comprehensive in his views of nature and creation. He was the first to show that the animal series was not a continuous chain of being, but rather should be compared to a tree, with its branches. In fact he was the first to construct a genealogical tree, the first attempt at a phylogeny of the animal world. He demanded unlimited time for the process of evolution. He anticipated the uniformitarian views of Lyell. He pointed out that where, as in Egypt, the climatic conditions have remained the same for many centuries, species have remained constant, but that under a varying environment they become modified. He writes of the struggle for existence, shows that the stronger devour the weaker; he refers to the principle of competition in the case of the sloth. He repeatedly insists on the fact that vestigial structures are the remains of organs which were actively used by the ancestors of existing forms. He shows, what is much insisted on at the present day, that change of functions in organs leads to their transformation or recreation, and that the assumption of new habits precede the origin of new, or the modification of organs already formed. A great deal is now said of the effects of migration and consequent geographical isolation in the origination of new species; Lamarck invoked this factor in the case of man, and he also pointed out the swamping effects of intercrossing. Lamarck's theory of use-inheritance is denied by some, but by others is regarded as an important factor in evolution. He does not, however, refer to the inheritance of mutilations, etc.

All these views lie at the foundation of the theory of organic evolution; yet Lamarck's opinions were set aside, misunderstood, and ridiculed. Some crude and ungrounded hypotheses were mingled with them. In his time the sciences of palæontology, embryology, and bionomics were undeveloped. Lamarck collected but few facts, and he lacked the experimental skill of Darwin; so that it was reserved for the latter naturalist, half a century later, to convert the world to a belief in evolution. At present, however, it is acknowledged that Lamarckism affords the fundamental principles on which rests the theory of organic evolution, and many of the most eminent naturalists have worked and are working along Lamarckian lines.

Consult: Packard, ‘Lamarck, the Founder of Evolution: His Life and Work, with Translations of his Writings on Organic Evolution’ (New York, 1901); H. Spencer, ‘Factors of Organic Evolution’ (New York, 1895); Cope, ‘The Primary Factors of Organic Evolution’ (Chicago, 1896). Alpheus S. Packard,
Professor of Zoology, Brown University.

Lamartine, Alphonse de, French poet and statesman: b. near Macon, Burgundy, 21 Oct. 1790; d. Paris March 1869. After being educated at the Jesuit College, at Belley, he spent some years without any definite occupation, devoting himself chiefly to poetry. By his first production, ‘Méditations poétiques’ (1820), he at once obtained a high place among the poets of the day. The ‘Nouvelles Méditations poétiques’ (1823) and the ‘Harmonies poétiques et religieuses’ (1828) established his poetic fame, and obtained for him admission into the French Academy (1830). In 1837 he was elected a member of the Chamber of Deputies. He still continued to write poetry, but his ‘Jocelyn’ (1835), ‘La Chute d'un Ange’ (1838), and ‘Recueillements Poétiques’ (1839), exhibited a marked falling off from his earlier performances. In the Chamber, where he represented Bergues, Le Nord, till 1848, his fame as a political orator steadily increased. Holding liberal-conservative views, he was for a time the head of a small independent party calling itself «Le parti social,» which aimed at the elevation of the people by a system of legislation based on philanthropic and religious principles. In the beginning of his political career he usually voted with the government, but at last was driven over to the opposition by the reckless obstinacy with which the government opposed all reforms. In 1847 he published his ‘Histoire des

Girondins.' After the February revolution of 1848 he became minister of foreign affairs in the provisional government. He was elected by ten departments a member of the constituent assembly, by which he was chosen a member of the executive committee. His alleged collusion with Ledru-Rollin gave the first blow to his favor with the people, which the disturbances of June converted into hatred. The tracts which he published in defense of his conduct were of no avail, and on the occasion of the elections to the Legislative Assembly in 1849 he was rejected. The place which he obtained in the last republican assembly was due to an after-election at Orleans. In consequence of the *coup d'état* of 2 Dec. 1851 he withdrew from public life. He further wrote some hasty works of small worth, including: 'Histoire de la Restauration' (1851-3); 'Histoire de la Turquie' (1854); 'Histoire de la Russie' (1855); 'Le Conseiller du Peuple' (1849-50); etc. His 'Mémoires' appeared in 1871. His biography has been written by Pelletan (1869); Janin (1869); Maynet Domville (1888); and E. Deschanel (1893).

Lamb, Charles, "ELIA," English essayist: b. London 10 Feb. 1775; d. Edmonton 27 Dec. 1834. Having entered Christ's hospital at seven, he remained in it till his 15th year, and had among his schoolfellows Coleridge, with whom he formed a lifelong intimacy. On leaving this school he was employed for a short time in the South Sea House, from which he removed in 1792 to an appointment in the accountant's office of the East India Company. Here he remained till 1825, when he retired on a pension of £441, living first at Enfield, and subsequently at Edmonton. The whole course of his domestic life was devoted to the safe-keeping and care of his sister Mary (b. London 1765), who in a fit of acute mania had stabbed her mother to the heart in 1796. She was subject to such fits all her life, but she survived her brother and died in 1847. In 1796 and 1797 some short poems by him appeared with others by Coleridge, and in 1798 he published a volume of poems with his friend Charles Lloyd, which met with little success. He was not more fortunate with a tragedy entitled 'John Woodvil,' written in imitation of the early English dramatists; and a farce entitled 'Mr. H.', performed at Drury Lane in 1805, also proved a failure. On the other hand, his tale of 'Rosamund Gray' (1798) was well received. In 1807 he wrote, in conjunction with his sister, a series of 'Tales from Shakespeare,' 'Mrs. Leicester's School,' and the 'Adventures of Ulysses.' All these proved very popular books for children. In 1808 he published 'Specimens of English Dramatic Poets Contemporary with Shakespeare,' with notes in which he draws attention to the simplicity and purity of the diction of the dramatists of that period. Almost all his other productions were contributions to different periodicals of his day. By far the best known, a series of essays, appeared first in the 'London Magazine,' under the name of "Elia." They have been frequently republished in a collected form since 1823, with 'Last Essays of Elia,' first issued in 1833. Here, in a style ever happy and original, and with humor of the rarest and most pungent description, he has carried the short essay to a point of excellence perhaps never before attained. With some failings Lamb was a man of fine character, and was beloved by a wide circle of friends. Consult Talfourd, 'Life and Letters of Charles Lamb' (1837); Talfourd, 'Final Memorials' (1848); Ainger, 'Charles Lamb' (1882).

Lamb, Isaac Wixom, American inventor and Baptist clergyman: b. Hartland, Mich., 8 Jan. 1840. He is known principally by his invention of the Lamb knitting machine (1863-5), which can produce more than 30 kinds of knit goods, and make about 4,000 loops in a minute at ordinary speed. He entered the Baptist ministry in 1869 and continued in the active discharge of pastoral duties till 1899.

Lamb, John, American soldier: b. New York 1 Jan. 1735; d. there 31 May 1800. He at first worked in New York with the elder Lamb in the trade of optician and mathematical instrument maker, but in 1760 entered the liquor trade. He was one of the 'Sons of Liberty' (q.v.) and active in all the early Revolutionary scenes in New York. Commissioned captain of artillery in 1775, he took part in Montgomery's expedition against Quebec, where he was wounded and made prisoner. Later, he rose to be colonel, and at the time of Benedict Arnold's treason, commanded at West Point. After the Revolution he was elected to the State legislature of New York, and for some years previous to his death held the post of customs collector of New York port. Consult the biography by Leake (1857).

Lamb, Martha Joan Reade Nash, American historian: b. Plainfield, Mass., 13 Aug. 1829; d. New York 2 Jan. 1893. She was married to Charles A. Lamb in 1852 and removed with him to Chicago, Ill., where in 1863 she was secretary to the United States Sanitary Commission Fair. She made her home in New York from 1866, and was editor of the 'Magazine of American History' from 1883 till her death. Her publications include a scholarly 'History of the City of New York' (1877-81); 'The Homes of America' (1879); 'Wall Street in History' (1883); 'The Christmas Owl' (1881); 'Snow and Sunshine' (1882).

Lamb, Mary Ann. See LAMB, CHARLES.

Lambayeque, lăm-bä-yā'kā, Peru, capital of the department of the same name, which was created in 1874. It is situated on the Lambayeque River, about 6 miles from the Pacific Ocean, the outlets for its trade being the ports of Eten and Pimentel, with which it has railway connection. Cotton and woolen fabrics are manufactured on a small scale. Its inhabitants, mainly of mixed blood, number about 9,000. The department of Lambayeque, lying between the Pacific and the departments of Piura, Cajamarca, and Liberdad, has an area of only 4,614 square miles, but contains some fertile lands which produce good crops of cotton, rice, and sugarcane. The total population of the department was estimated to be 124,091 in 1896, but is probably much less.

Lambert, Alexander, American pianist: b. Warsaw, Poland, 1 Nov. 1862. He studied in early life with his father, and on the advice of Rubinstein was sent to the conservatory at Vienna, where he graduated in 1880. In 1881 he gave a series of concerts in New York, which he repeated the next season through Germany and Russia. After studying for a while under

Liszt he returned (1884) to the United States and in 1888 became director of the New York College of Music, a position which he still holds. He is author of many compositions, but is best known as a teacher. He has written 'Systematic Course of Studies' (1892).

Lam'bert, Daniel, English citizen famed for his unusual corpulence: b. Leicester 13 March 1770; d. 21 June 1809. Up to his 19th year he gave no indications of the remarkable stoutness which he afterward attained, being an enthusiastic lover of field sports and athletic exercises. Having succeeded his father as keeper of the Leicester prison, he exchanged an active for a sedentary life, and from this time rapidly increased in size till he became an object of public curiosity, and attracted visitors from all parts of the country. He now resolved to turn his obesity to account, and in 1806 commenced an exhibition of himself in Piccadilly, London. He afterward exhibited himself in the principal towns of England. At the period of his death he was 5 feet 11 inches in height, weighed 739 pounds, and measured 9 feet 4 inches round the body, and 3 feet 1 inch round the leg. In diet he was remarkably abstemious, drank water only, and never slept more than eight hours.

Lambert, Johann Heinrich, yō'hän hīn'rĭʜ läm'bĕrt, German mathematician and philosopher: b. Mühlhausen 29 Aug. 1728; d. Berlin 25 Sept. 1777. His father was a tailor in humble circumstances, and he was obliged to follow his father's employment. In this situation he spent the greatest part of the night in study, and soon acquired a knowledge of mathematics, philosophy, and the Oriental languages. He afterward became tutor to the sons of Solis, president of the Swiss Confederation. In 1756 he accompanied his pupils to Göttingen, in the following year to Utrecht, and in 1758 to Paris, Marseilles, and Turin. In 1759 he was released from his duties, and in 1764 Frederick the Great appointed him to the head of the Architectural Council, and made him a member of the Academy of Sciences. He enriched the transactions of various societies with his papers and treatises, all of which bear the stamp of eminent and original genius. Most of his mathematical pieces were collected in three volumes by himself. Philosophy, and especially analytic logic, are greatly indebted to him for his 'Novum Organon, or Thoughts on the Examination and Relations of Truth' (1764); and his 'Architektonik, or Theory of the First Simple Principles in Philosophical and Mathematical Knowledge' (1771).

Lam'bert, John, English soldier: b. Kirkby Malhamdale, Yorkshire, 7 Sept. 1619; d. island of Guernsey 1686. He entered the army and had attained the rank of colonel in 1644, when he fought against the king at the battle of Marston Moor. He accompanied Cromwell into Scotland in 1650, where he distinguished himself by great gallantry, and took the lead in the council of officers who gave the protectorate to Cromwell. He subsequently opposed the Protector and was deprived by Cromwell of all his commissions, though a pension of £2,000 was allowed him for past services. When Richard attempted to assume the protectorate Lambert came forward, and became the head of the Fifth Monarchy Men, or extreme republicans. In 1660 he set out for the north to encounter Monk, but was deserted by his troops, seized, and committed to the Tower whence he soon escaped. At the Restoration he was excepted from the act of indemnity, brought to trial, and condemned, but his sentence was commuted to banishment to Guernsey.

Lambert, Louis A., American Roman Catholic clergyman: b. Charleroi, Pa., 13 April 1835. He was educated at St. Vincent's College, Pa., and the archdiocesan seminary, St. Louis, and was ordained to the priesthood in 1859. He was chaplain in an Illinois regiment during the Civil War, was pastor at Cairo, Ill., 1863–9, and subsequently at Seneca Falls and Waterloo, N. Y.; founded the 'Catholic Times' in 1874, and was its editor till 1880, and has been editor-in-chief of the New York 'Freeman's Journal' since 1894. He has published 'Thesaurus Biblicus'; 'Notes on Ingersoll'; 'The Christian Father'; etc.

Lam'berton, John Porter, American editor and author: b. Philadelphia 22 Oct. 1839. He was graduated from the University of Virginia in 1858, and after teaching, 1859–80, became an assistant in the library of the University of Pennsylvania. He was associate editor of the American Supplement to the Encyclopædia Britannica, 1881–90, reviser to Webster's Dictionary, 1891–5, and has edited 'Historic Characters and Famous Events' (12 vols. 1894–6); 'Literature of All Ages' (10 vols. 1897–9); 'Literature of the 19th Century' (1900).

Lam'bertville, N. J., city in Hunterdon County, on the Delaware River, the Delaware & Raritan canal and the Pennsylvania railroad; 16 miles northwest of Trenton. Water power is here furnished for extensive paper mills, rubber works, spoke factories, stone-quarries, flour mills and foundry and machine shops. The city was first incorporated in 1849, and under a charter of 1874 is governed by a mayor and council elected every two years. Pop. (1890), 4,000; (1900) 4,640.

Lamberville, Jean de, zhŏṅ dė läṅ-bär-vēl, French missionary. In 1671, as a member of the Jesuit order and under their direction, he settled in the Iroquois village of Onondaga. He had previously spent three years in Canada, and he now became active in cementing the alliance between the Indians and the French. Meanwhile Governor Dongan of New York was straining every nerve to win over the Iroquois League to the English, but without success. Lamberville was obliged to abandon his post by the risk he ran, when the Iroquois delegates were treacherously seized at a point in Ontario to which they had repaired on receiving pledges of a peaceable conference (1687). He died in France.

Lam'beth, a parliamentary and municipal borough in London, on the south of the Thames, opposite Westminster. See London.

Lambeth Articles, in English ecclesiastics, a name given certain doctrines of predestination, justification and free-will, drawn up at Lambeth Palace in 1595 by William Whitaker and other Calvinists. They were approved by Archbishop Whitgift but disapproved by Queen Elizabeth.

Lambeth Conference, an assemblage of Anglican bishops at Lambeth Palace, in England in 1867, at which 67 bishops were present.

The second conference held in 1878 was attended by 100 bishops. In 1888 there were 145 present, and in 1897 over 190. The conference does not legislate or formulate church doctrines, but finds profit in discussing serious ecclesiastical problems. The conference will continue every 10 years. Consult 'The Lambeth Conferences of 1867, 1878, and 1888' (1889).

Lamb'kill, or **Calf-kill.** See SHEEP-LAUREL.

Lamb's Lettuce. See CORN-SALAD.

Lamb's-quarters, a roadside "pig-weed" (*Chenopodium album*). See GOOSEFOOT.

Lamech, name of two scriptural personages mentioned in the book of Genesis. (1) Descendant of Cain, and the first polygamist on record. (2) Son of Methusaleh, and father of Noah, lived 777 years, and died five years before the Flood.

Lamennais, Hugues Félicité Robert de, üg fā-lē-sē-tā rō-bār dė lä-mĕ-nā, French religious and political writer: b. Saint Malo 19 June 1782; d. Paris 27 Feb. 1854. He was ordained priest in 1817. The same year appeared the first volume of his 'Essay upon Indifference in the Matter of Religion' (1807–20), a work of profound learning and of strict orthodoxy. He became the critic of Church policy, and his journal, 'L'Avenir' (The Future) was condemned by the pope. He bowed to Rome's decree; but after a year published his 'Words of a Believer' (1834), in which he repudiates all authority of popes and bishops. It was followed by 'The Book of the People' (1837), and 'The Past and the Future of the People' (1842), in the same tone. He wrote also: 'Sketch of a Philosophy' (1841). Consult: Newman, 'Essays Critical and Historical'; Lilly, 'Studies in Religion and Dogma.'

La Mesa, lä mā'sä, Colombia, a picturesque city, located on a high plain about 25 miles from Bogotá. Owing to its elevation above sea-level (4,225 feet), its climate is genial. The surrounding country is a fertile agricultural region. Pop. 14,000.

Lamia, a mythical queen of Libya, who, on being robbed of her own children by Hera, devoted her life to strangling and eating children. In later story Lamia was a vampire who seduced and then sucked the life-blood of young men. As a vampire she appears in Goethe's 'Die Braut von Korinth' and Keat's 'Lamia.'

Lam'mas Day, in the calendar, the 1st day of August, so called perhaps from the custom which formerly prevailed among the tenants who held lands of the cathedral church in York, England, of bringing a live lamb into the church at high mass on that day.

Lammergeier, lăm-ėr-gī-ėr, the largest of European eagles (*Gypaëtus barbatus*), often called griffon-vulture because it frequently feeds on carrion, especially bones abandoned by other animals, which it has power to break, or carries to a great height in the air and then lets fall; it does the same with tortoises, which form an important part of its fare in some countries. The lammergeier is a bird of the mountains and deserts of southern Europe (where it has now been nearly exterminated), northern Africa and southern Asia; it builds a great rude nest on some mountain ledge and lays a single brown-blotched egg.

Lamon, Ward Hill, American biographer: d. Martinsburg, W. Va., 7 May 1893. He was the law partner of Abraham Lincoln at Springfield, Ill., and after the latter's election as President became his private secretary and was appointed by him marshal of the District of Columbia. He published: 'Life of Abraham Lincoln, from His Birth to His Inauguration as President' (1872); 'Recollections of Abraham Lincoln.'

Lamon, lä-mōn', **Bay of,** a landlocked bay on the eastern (Pacific) coast of Luzon, Philippines, dividing the southeastern peninsula from the main part of the island. The island of Alabat and smaller islands make an inner bay on the south. The bay is bounded by the provinces of Infanta, Laguna, and Tayabas, on the south and west, and by the provinces of Tayabas and Ambos Camarines (Norte) on the south and east. On the northwest coast of the bay is the port of Lampón, Infanta, which was important in the latter part of the 16th century and the 17th century as the harbor of the Spanish galleons between Manila and New Spain, it being thought a safer way of communication than the straits of San Bernardino.

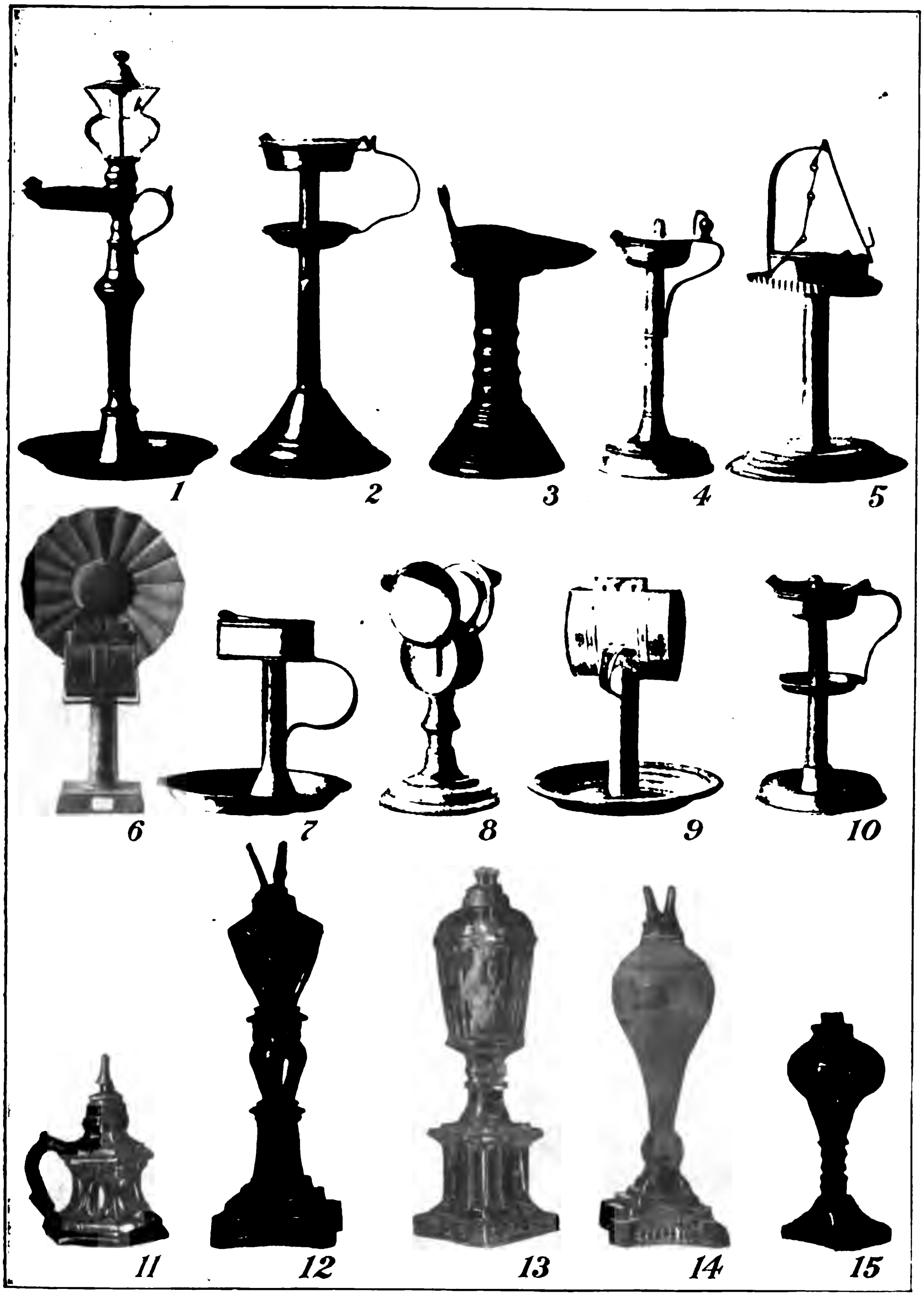
Lamont, Daniel Scott, American politician; b. Cortlandville, N. Y., 9 Feb. 1851; d. Millbrook, N. Y., 23 July 1905. He was educated at Union College, entered journalism at Albany, became a political correspondent, in 1883–9 was private secretary to Grover Cleveland, was later in business, and in 1894–7 was secretary of war in Cleveland's second administration. In 1897 he was elected vice-president of the Northern Pacific railway company.

Lamp, any contrivance which through the formation of its parts affords a means of producing light, and sometimes heat, by the combustion of oils, fats or inflammable fluids, with the aid of a wick, which, by capillary attraction, conveys the substance burned to the flame point. By modern adaptation of the word many appliances for producing light by gas or electricity are designated as lamps. Man ignorant of fire is unknown, therefore, the use of the burning brand as a torch may be regarded as coeval with the race, and the torch as the progenitor of the succeeding lamp. Considered archaically the primitive lamp was a very simple device. An unworked stone, having a natural concavity, a sea shell, or the skull of an animal, constituted the earliest forms. A bit of moss, or a twist of vegetable fibre served as a wick. Fat, grease, or fish oil furnished the illuminant. The introduction of the lamp marked the first stage of man's advancement towards civilization, and may, therefore, be appropriately considered as a figure or symbol on the dial of time pointing to the dawn of his intellectual awakening. When, or where, or by what people the first lamps were made cannot now be determined. Recent archæological discoveries in the ruins of the long buried cities of the Mesopotayian plain, Assyria, have revealed many terra-cotta lamps of a variety of forms, and of good workmanship, that were in common use 7,000 or 8,000 years B.C. It would be an unwarranted assumption to assert that these well developed creations denote the beginning of the lamp. Stone lamps have been found that are undoubtedly of great antiquity, but this fact alone does not necessarily class them as palæolithic, they are simply prehistoric, and of an age that cannot be definitely determined. The so-called Stone Age determines so little that is of real chronological value that classifications in archæology cannot always be wisely made upon data thus furnished. French archæologists have within a few years recovered from the lakes of Switzerland bronze lamps that were in use by the lake-dwellers at a period late in the Lacustrian Age. These are without doubt the most ancient metal lamps yet discovered.

Early Examples.— Whether the first emigrants from Asia into ancient Greece found the Pelasgic races using lamps, or whether the invaders brought the art of lamp making with them, neither legend nor tradition has left even a mythical answer. In our researches in lamp archæology we can at the best but work our way backwards, from the known to the unknown, from the ascertained facts to that dim, mysterious darkness of remote antiquity where all traces of chronology are lost, and where our conclusions must be largely sustained by deductions drawn from analogical reasoning. The poems ascribed to Homer, 950 B.C., contain all that we know of the manners and customs of early Greek society. He speaks of the «Festival of Lamps,» and makes frequent mention of the torch. The Greek and Roman torch was often simply a terra-cotta, or bronze, lamp-shaped device secured to a staff. The so-called «grease-pot-lamp» of Egypt is without doubt more ancient than the oldest lamp of Greece, and the terra-cotta lamps of Babylonia are also thousands of years older. Egypt as a nation was on the decline when the history of Greece began. Assyrian records found on clay tablets proclaim a nation with a remoteness of antiquity as yet undetermined. Among the many ancient relics discovered in the ruins of the Babylonian cities have been terra-cotta lamps that closely resembled those of early Greece. This similarity of configuration between the earliest examples discovered and those of Greek make of a period that was perhaps mid-way between the first Olympiad, 776 B.C., and the beginning of the Christian era is remarkable. Only the simplest essentials are represented. A shallow, saucer-shaped oil or fat reservoir being the most primitive of terra-cotta lamps. Then comes the oval in shape, with a slight prolongation of the rim into a short, narrow rostrum, or wick support, and the formation of a rudimental handle. Then the oval-shape with the reservoir enclosed, and one or two wick supports. These constitute the types that were essentially common to all Eastern lands. The later Greek and Roman lamps, both terra-cotta and bronze, are remarkably rich in ornamentation, and artistically graceful in form. These constitute a division that separates the crude primitive from the finished product. The earliest terra-cotta lamps were made in one piece, and baked without glazing. Later Greek and Roman terra-cotta lamps were made in two principal parts, the «*crater,*» or oil reservoir, and the «*discus*» or covering for the reservoir. Each of these parts were joined together after being molded, and then baked. The ornamentations were generally confined to the «*discus,*» and were called the «*limbus.*» The «*nasus,*» or wick support, as well as the «*ansa,*» or handle, were most frequently made separately and carefully attached to the body of the lamp before baking. The «*discus*» had a small circular opening near the centre through which the lamp could be filled. Many of the better lamps had the maker's name, and often his private mark, stamped on the bottom. Large terra-cotta lamps were frequently made with two, three, and sometimes six or even 12 «*nasi.*» The lamp with «*nasus*» for one wick was called a «*monomyxos,*» and that for two wicks a «*dimyxos,*» and so on. The Greek and Roman bronze lamps were made in an almost endless variety of forms, and were often beautiful and artistic to a marked degree. Plain iron lamps were used by the common people at a later period. They were either cast or forged in a single piece, and were mostly ectypes of the more artistic and costly terra-cotta and bronze lamps, but were without decorations. The study of the ancient lamp maker was devoted alone to the external form of his wares. Grace, beauty and elegance, as expressed in outlines and decorations, were his chief concern. No attempt was made to improve the light. The pale, smoky, flickering flame continued to shed its uncertain light from the massive and costly silver candelabrum of the wealthy just as it had for untold ages from the simple stone and terra-cotta lamps of their ancestors. Etruscan terra-cotta and bronze lamps so closely resembled those of early Greek make that a separate description is not required in this article. The chief characteristic, however, that distinguished the true Etruscan pottery from that of Greece is the strong coloring that was applied to the former. What was true of the art of lamp making in Greece was also true of the rest of the civilized world, for it was more than 17 centuries after the Christian era before any real improvement was introduced in lamp construction.

The Inventive Age.— Prior to 1783 many lamps and illuminating appliances had been introduced, but there was little if any improvement in the light afforded, or marked advancement in the construction or mechanical arrangement of the parts designed to increase the brilliancy of the flame. The first real improvement was the introduction of the flat, woven, ribbon-like wick, and the securing the wick in a close-fitting support. This arrangement permitted only a small surface of the wick to be exposed to the flame, and the wick being narrow the flame came in contact with the centre as readily as the outward parts and thus most of the free carbon was consumed, consequently there was less smoke than in the old style of loose wick. M. Legers of Paris introduced this improvement in 1783. To this was attached for the first time a spur-wheel, which by rotating adjusted the wick, thus regulating the flame. The same year M. Argand, the Swiss chemist, introduced his improvement in burners, which consisted of a tubular wick attached to a tube which extended through the oil reservoir and opened into the base of the lamp, thus affording a means of centre draught, which supplied an abundance of oxygen to the flame and created sufficient heat to consume all of the carbon and so prevented the escaping of smoke. This was truly the beginning of a new era in lamp making, for the art now entered upon what may be designated as «the inventive age of the lamp.» Science and invention now came to the aid of the artisan. Principles involving an understanding of the laws of combustion and the science of light were applied to the construction of illuminating devices. The result was more

LAMPS.



1–10. Early English and American Colonial Lamps: 1. Horologic Lamp, Pewter, 1600. 2. Old Dutch Lamp, Copper, 1640. 3. Iron Slot Lamp Pottery Upright, Penn. Dutch, 1745. 4. Old English Pewter Lamp, dated 1708. 5. Tin Newburyport (Mass.) Betty, 1724. 6. Tin Lard-oil Lamp, with reflector, 1830. 7. Portsmouth (N. H.) Betty, Tin, 1760. 8. Old English Bulls Eye Lamp, Pewter, 1770. 9. Tin Lard-oil Lamp, 1840. 10. Old English Pewter Lamp, 1720.

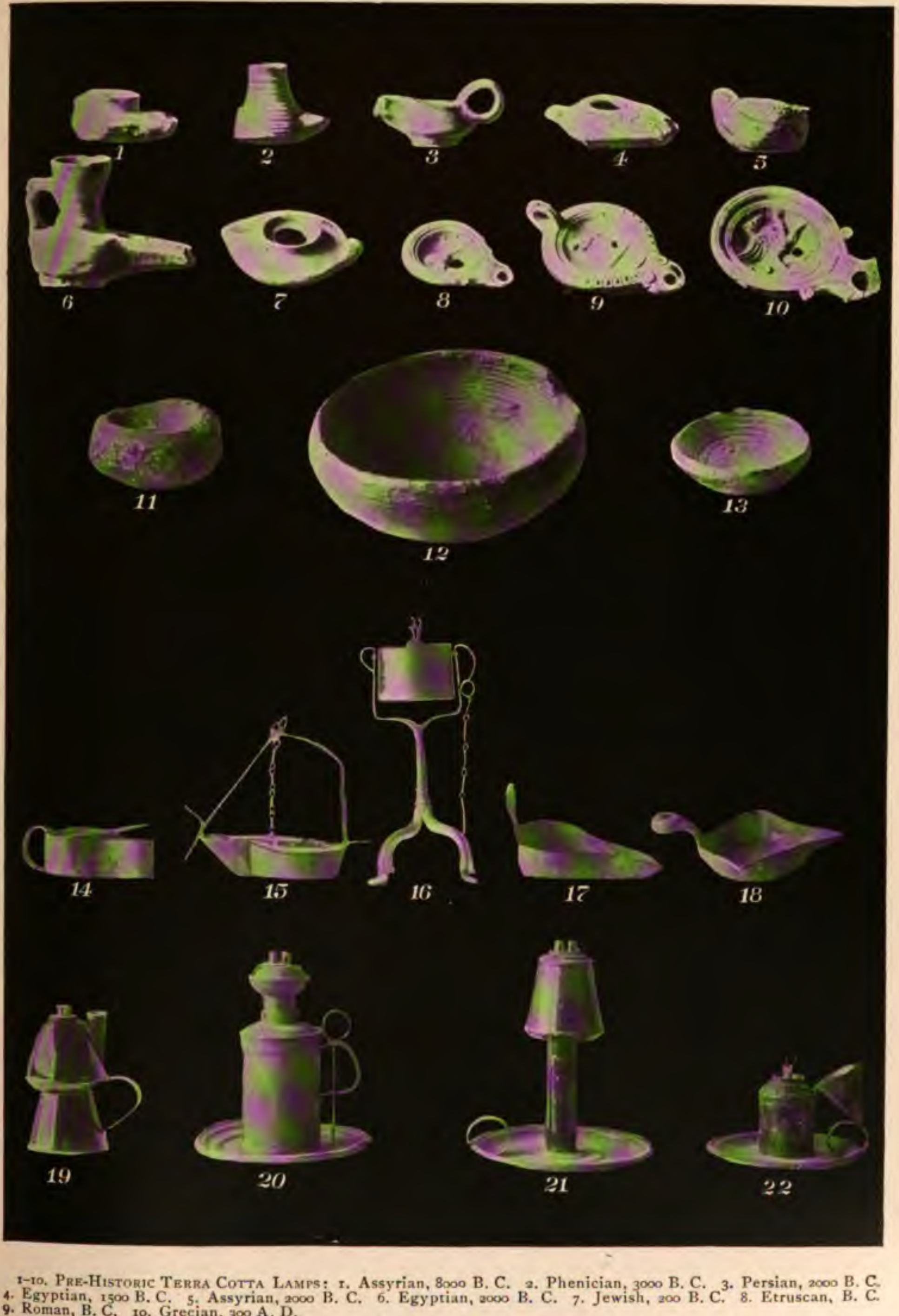
11–15. Early American Glass Lamps: 11. Glass Camphene Lamp, 1845. 12. Glass Camphene Lamp, 1850. 13. Glass Whale-oil Lamp, 1830. 14. Glass Camphene Lamp, 1848. 15. Glass Whale-oil Lamp, 1760.

light and better light. Argand's epoch making invention related wholly to his improved burner. His first lamps were simply huge oil reservoirs with his new burner attached to the top. He used sheet iron chimneys formed with a hood opening over the flame. The use of glass chimneys with the Argand burner came about purely by accident. A workman in attempting to heat a bottle over the flame cracked off the bottom, and because the glass had become too hot for him to hold he momentarily placed it over the burner. The result was surprising, the brilliancy of the flame was not only increased but the light became steady and in every way superior to that produced with a sheet iron chimney. The brilliancy of the light on the top of the huge reservoir made a wide shadow. To overcome this was a problem that was finally solved by a German lamp maker, who produced a model in which the burner was secured to the end of a long neck or rostrum, very much like the present so-called German student lamp. The removing of the light away from the great reservoir not only reduced the shadow but afforded a more ready means of supplying the oil to the wick uniformly. In 1800 Carcel introduced his ingenious lamp which was provided with a clock-work device, which operated a small pump, raising the oil from the base of the lamp to the wick-holder, thus keeping the wick uniformly submerged in the oil. This contrivance was too costly to come into general use, and was confined mostly to lamps used in halls and large rooms. Many lamps were offered by makers that were designed to burn crude, heavy whale oil, and others in which lard oil was consumed. Lard oil lamps were inconvenient in cold weather, for the oil would become solid. To overcome this several devices were invented. Perhaps the most successful was the lamp with a copper tube, the upper end of which was between two wick tubes, while the lower end passed through the oil to the bottom of the lamp. Copper being a good conductor of heat, the oil was thus kept in a liquid state while the lamp was burning. For many years lard oil was the only illuminant used in the great lamps of the lighthouses of the world. It was not until after 1880 that burners for lighthouse lamps had been constructed that would satisfactorily consume kerosene oil. Up to about 1800 but few small, portable lamps had been made. Nearly all the appliances so far introduced for domestic illumination were large, so-called, table lamps, and mural lamps. English manufacturers first made small hand lamps of tin, brass and pewter. These were mostly lard or whale oil burners, with a single wick tube. In the whale oil lamps the wick tube was round, in the lard oil lamps the flat, woven ribbon-wick was used, the wick being moved up and down in the lard oil lamps by a spur-wheel. In the whale oil lamps a small aperture in the upper part of the wick tube was provided, through which «a prick» could be inserted by which the wick was pricked up or down. In the large and important field of research and experiment in domestic illumination, American genius and skill very early took a prominent part.

Lamps in America.— Before proceeding to the introduction of a description of early American inventions relating to lamps and lighting appliances, it will be interesting to briefly notice what may be truly designated as the original American lamp. There has never been found among the remains of the mysterious mound-builders of the Western Continent any utensil that could be rightly regarded as a lamp. The North American Indians, who were found inhabiting the country on the arrival of the first Europeans, did not possess a lamp. The pine torch was their only means of artificial illuminating. The one lamp that can claim the distinction of being really American is the stone lamp of the Eskimo. This is usually a shallow vessel of stone, most frequently of soap-stone, sometimes bone, clay, wood, and the skull of an animal is used. The oil of the seal, walrus and whale is burned in these rude lamps, dry moss serving as a wick. These lamps also serve as stoves, for they are used for cooking and warming. Without these simple lamps human life could not be maintained in the inhospitable regions these strange people inhabit.

The first lamps used in the Plymouth Colony were of Dutch make, and were called by the English emigrants Betty lamps (German, *Besser-better*). The few lamps that the Pilgrim fathers brought with them in the Mayflower on her memorable voyage were of this class. They are of iron, either forged from a single piece or were cast of gray, coarse iron. The earliest of these were known as the open Betty, or «Slot lamp.» Then followed the Betty with a top, one part of which was formed as a hinged lid. The wick support was an angular, half round iron secured to the inside bottom of the lamp. There was an upright handle at the back, to which was attached, by a link, a pointed hook, the point of which extended beyond the crook. This was used to suspend the lamp from the high back of the rush-bottom chair, or the point was thrust into the crevice between the great stones of the side of the open fire-place. The Betty was pear shaped, flat on the top and bottom. This form was sometimes made in brass, but rarely was any attempt made at ornamentation. These lamps were in use in some parts of the New England colonies as late as 1790. Prior to 1680 all lamps used in the American colonies were imported, mostly from England. In 1680 a tinsmith of Newbury, Mass., began the manufacture of tin Betty lamps. These, after Newburyport was separated from Newbury, became known as Newburyport Bettys. Later these lamps were made in Rivermouth (Portsmouth, N. H.) and were called Portsmouth Bettys. In 1720 a few pewter and brass lamps had been made by small manufacturers at Salem, Mass., and Providence, R. I. These were heavy and extremely inconvenient to be carried about. Among the earliest makers of pewter lamps and candlesticks in the New England colonies was Richard Graves, a pewterer who came from England, where he had learned the trade, or, as it was then called, the art. He came first to Boston, but moved to Salem, Mass., where he long worked at his business, and brought out many fine goods in his line. Henry Shrimpton of Boston was also a maker of fine pewter lamps, and his beautiful lamps and candlesticks graced many of the grand old colonial homes. Among the earliest American experimenters in lamp construction, and inventors of improved burners, was that marvelous investigator, philosopher, statesman and inventor, Benjamin Franklin (q.v.). Not content with perfecting an improved stove known as the Franklin heater, he

LAMPS.



1–10. Pre-Historic Terra Cotta Lamps: 1. Assyrian, 8000 B. C. 2. Phenician, 3000 B. C. 3. Persian, 2000 B. C. 4. Egyptian, 1500 B. C. 5. Assyrian, 2000 B. C. 6. Egyptian, 2000 B. C. 7. Jewish, 200 B. C. 8. Etruscan, B. C. 9. Roman, B. C. 10. Grecian, 300 A. D.

11–13. Lamps of Arctic North America: 11. Eskimo Soapstone Lamp, North Greenland. 12. Eskimo Clay Lamp, Yukon Valley. 13. Eskimo Clay Lamp, North Alaska.

14–22. Early American Colonial Lamps: 14. Tin Betty, 1632. 15. Iron Betty, 1620. 16. Fat Lamp, Brass dish, iron upright, 1680. 17. Iron Slot Lamp, 1640. 18. Cast Iron Fat Lamp, 1700. 19. Tin "Petticoat" Lamp, Whale-oil burner, 1832. 20. Tin Whale-oil Lamp, 1812. 21. Tin Upright, Franklin burners, Whale-oil, 1750. 22. Guest Lamp. Tin, Whale-oil, used in old-time inns, 1822.

structed that the flame was diffused more generally than in other lamps, while the bulb-shaped glass chimney created a hot-air chamber in which all free carbon was consumed. The light was profuse, white and clear. This firm manufactured a large variety of elegant lamps, which were used extensively in the homes of the wealthy. Benkler's lamp, introduced in 1840, had a tube through which air was admitted to the flame, the angle of the tube being such that an upward movement of air was produced when the oxygen came in contact with the heat, and thus a forced draught was secured which made the light constant, and aided greatly in the consumption of smoke. Through the means thus adopted, cheap heavy oils could be burned without the offensive smell and excessive smoke produced by cheaper lamps when these low grade oils were consumed.

Coal Oil and Kerosene Lamps.— About 1845 was introduced in the United States, a compound that was known as burning fluid, or from its inventor's name, Potter's fluid. This was a highly explosive illuminating fluid, composed of a mixture of about three parts of wood alcohol to one of purified oil of turpentine. This was burned in lamps provided with long slender, tapering brass tubes, secured to a disk that screwed into a collar fitted to the upper part of the lamp. The wick was round, firmly woven cotton, which closely fitted the wick tubes. This was to prevent the escape of the vapor from the fluid. Little thimble-shaped caps, secured by small chains, were provided to cover the end of the wick tubes when the lamp was not in use. This was to prevent the evaporation of the highly volatile burning fluid. Camphene was the trade name of a burning fluid composed of oil of turpentine, purified by being distilled over quick-lime. This fluid was burned in lamps provided with the same class of burners as that described for burning fluid. The highly explosive nature of these dangerous compounds rendered them unpopular for domestic use, and they were soon displaced by the safer and cheaper kerosene oil, which came into general use about 1850. This was first called coal-oil, and in some localities mineral oil, while in others it was known as petroleum oil. Many hundreds of lamps and burners have been invented to use this cheap illuminant. In all successful kerosene burners a glass chimney is necessary. Many attempts have been made to produce a kerosene burner that would afford a clear, brilliant, steady, smokeless flame, without a chimney, but so far no good, practical lamp has been put on the market that successfully accomplishes this much desired result. A lamp was made and introduced in 1869 that burned a vapor of naphtha without a chimney. While the flame from this device was white and brilliant, the light was flickering, and when moved about emitted annoying smoke. The highly explosive nature of the fluid burned made its common use unsafe, so that the vapor lamp never became popular. What is known as the German student lamp, supplied with an improved Argand burner, and the so-called Rochester lamp, employing another modification of the Argand burner, are the best and most successful kerosene lamps so far introduced. There are hundreds, if not thousands, of different kerosene oil burners attached to an almost endless variety of lamps now on the market. These embrace hand lamps, table lamps, piano lamps, and a variety of library and parlor lamps that are remarkably rich in ornamentation and graceful in form and shape, but in the construction designed to assist the combustion of the oil in producing the illumination the same general principles are involved, and with the exception of the smaller hand lamps the original Argand burner principle is adhered to, with slight modifications and improvements. In the small hand lamps a perforated hood-shaped cap surrounds the wick making a dome-like chamber through which the air drawn from the outside is deflected into the flame, thus supplying the needed oxygen. The flat ribbon wick is used in most of the smaller lamps, the wick being moved up and down by a spur-wheel as before described.

Safety Lamps are lamps so constructed that the danger from the foul explosive air of mines, especially deep coal mines, may be lessened or prevented, by so protecting the flame of the miner's lamp that it will not come in direct contact with the mixed carburetted hydrogen and atmospheric air, which is often present in such quantities as to create an element of great danger. The first safety lamps were called "Steel-Mills," and were devices in which small steel wheels, with roughened edges, were rapidly revolved against a flint, securely held by a powerful spring. The sparks thus produced afforded an intermittent light which was sufficient to illuminate the more dangerous parts of the deep mines. But as this lamp necessitated the employment of a boy to revolve the wheel while the miner was engaged in his work, it proved too expensive for economic use. In 1813, Dr. Canny in England, introduced the first true safety miner's lamp. In his invention he produced a lamp in which the external air was admitted to the burner through a chamber containing water, while the flame was protected by a glass bulb, the product of combustion escaped through perforations in a flat support on which the glass bulb rested. This contrivance was so cumbersome, and so liable to breakage, that it never came into general use. In 1815, George Stephenson and Sir Humphry Davy, contrived a safety lamp that, with slight modifications, has continued in use up to the present time. The air to support combustion was admitted to the flame through small openings in the bottom of the lamp, while the flame was protected by a glass, upright cylinder, the top of which was covered with a wire gauze cap. Several forms introducing slight changes from the original Davy lamp have been made. The lamp in which the flame is protected by a wire gauze cylinder in the place of a glass one was a later invention of Sir Humphry Davy. Mackworth's safety lamp was an improvement over the Canny lamp, and introduced features common to that and the Davy lamp. A water chamber was provided through which the external air passed before reaching the flame. Immediately surrounding the flame was a thick, glass cylinder and above that a fine wire gauze cylinder, making a continuous protection about the flame. Outside of this was an additional wire gauze cylinder added as a means of protection against breakage. Lamps for jewelers, chemists and laboratory use are in reality miniature furnaces, and are generally provided with wide wick supports in which are large cotton wicks. Alcohol is the most common fluid used for generating heat in these lamps. Painter's lamps are contrivances in which naphtha is burned under pressure, the resulting heat being employed in the removing of old paint from surfaces which it is desired to repaint. Hand lanterns are simply lamps of various forms, surrounded by glass globes or cylinders to protect the flame from the wind. Ancient lanterns were provided with transparent protectors made of horn scraped thin to permit the light to be reflected through. The word lantern is a combination of lant-horn, and was employed to express a light which was protected with a transparent horn. Another form of early lantern, now designated by collectors as the «Guy Fawkes lantern» was of tin, perforated with small punctures through which the light shone. Early hall, or as they were called entry lanterns, were often massive and elegant ground glass globes, ornate and beautiful to a marked degree. Either candles or oil were used as illuminant. They were suspended by chains from the ceiling, and a glass smoke protector was provided in those of more elaborate make.

C. A. Quincy Norton, M.D.

Lamp'adrome, in ancient Greece, a running race with torches, customary at certain sacred festivals. The competitors were young men, to each of whom a lighted torch was given, and he who arrived first at the goal with his torch still alight was the winner.

Lamp, Electric. See Electric Lighting.

Lampasas, lăm-păs'sas, Texas, town and county-seat of Lampasas County, on a branch of the Lampasas River, and the Texas C. and the Gulf, C. & S. Fe R.R.'s; 80 miles northwest of Austin. There is a large trade here in agricultural produce, live stock, cotton, grain, wool, and has cotton gins, wagon and carriage factories, flour-mills and other industries. Sulphur springs in the locality have attracted many invalids here. Pop. (1890) 2,400; (1900) 2,107.

Lampblack, finely divided carbon or soot, produced on a commercial scale by the imperfect combustion of organic materials that are rich in carbon, such as tar, resins, pitch, and petroleum. The combustion is usually carried out in brick furnaces, or in cast-iron vessels, to which a smaller supply of air is admitted than would be required for complete oxidation. The dense smoke that results is led through a series of settling chambers, in which the lampblack is deposited, the finest grade being precipitated in the last chamber. Lampblack so prepared contains about 80 per cent of carbon, the remaining portion consisting of oily and resinous matters, together with moisture and certain inorganic substances, such as ammonium sulphate. The resinous and other organic constituents can be removed by heating to redness in a closed crucible, after which the soot is digested with hydrochloric or sulphuric acid, and finally washed to remove the inorganic constituents. Lampblack is used chiefly in the manufacture of paints and printers' inks and for these purposes the crude product is sufficiently pure. For the manufacture of Chinese ink «India ink») the purified soot is preferable. See also Carbon.

Lamper-eel, or **Lampern,** a lamprey (q.v.).

Lamp'man, Archibald, Canadian poet: b. Morpeth, Kent County, Ontario, 17 Nov. 1861; d. Ottawa, Ontario, 10 Feb. 1899. He was graduated from Trinity College, Ontario (1882), and after 1883 held an appointment in the Post-office Department of Ottawa. He published two collections of poems, ‹Among the Millet› (1888); and ‹Lyrics of Earth› (1895). His ‹Complete Poems› with ‹Memoir› by D. C. Scott appeared in 1900.

Lamprecht, Karl, German historian: b. Jessen, near Wittenberg, 25 Feb. 1856. He was educated at Göttingen, Leipsic, and Munich, and in 1885 became professor at Bonn; in 1890 at Marburg; and since 1892 has occupied a similar office at Leipsic. In 1905 he represented Germany at the Congress of Science held at Saint Louis. He founded in 1882 the ‹Wesldeutsche Zeitschrift für Geschichte und Kunst.› His writings include: ‹Beiträge zur Geschichte des französischen Wirtschaftslebens im elfen Jahrhundert› (1878); ‹Die römische Frage von König Pippin bis auf Kaiser Ludwig den Frommen› (1889); ‹Zur jungsten deutschen Vergangenheit› (1901); etc.

Lam'prey, an eel-like creature of the group *Cyclostomi* and family *Petromyzonidæ*. The anatomical characters are described under Cyclostomi. The lampreys feed principally on fishes, to which they attach themselves by their suctorial mouths, and then scrape away the flesh with their rasp-like teeth. There are about 7 genera and 15 species, living mostly in the north temperate zone. Lampreys inhabit both salt and fresh waters, but those of the sea ascend rivers and brooks to deposit their spawn on pebbly shallows, and great numbers die there. Most of them are plainly dark colored, but some of the fluviatile species are bluish or silvery, as the common one (*Ichthyomyzon concolor*), in the Upper Mississippi Valley and Great Lakes, which is about a foot long.

Lamp'ton, William James, American journalist: b. Lawrence County, Ohio. He was educated in public and private schools and at the Ohio Wesleyan University and Marietta College; edited a newspaper in Kentucky (1887–8); was reporter for the Cincinnati *Times*, writer for the Steubenville *Herald* and the Louisville *Courier-Journal*, editor of the ‹Merchant Traveler,› Cincinnati, and has been on the staff of the ‹Critic› and the *Evening Star*, Washington, and of the Detroit *Free Press*. He has also been a special writer for the New York *Sun* and the New York *Herald*. He has published ‹Yawps and Other Things.›

Lam'son-Scribner, Frank, American botanist: b. Cambridgeport, Mass., 19 April 1851. He was graduated at the Maine State College of Agriculture in 1873; served two years as clerk to the secretary of the Maine State Board of Agriculture; and was an officer of Girard College (1876–84). In 1887 he was made chief of the Section of Vegetable Pathology in the United States Department of Agriculture, and from 1888 to 1894 was professor of botany in the University of Tennessee, and director of the agricultural experiment station there 1890–4. Since 1902 he has been chief of the Insular Bureau of Agriculture, Philippine Islands. In 1889 he received from the French minister of agriculture the cross of the Chevalier du Mérite Agricole. Among his writings published in the proceedings of various bodies, and in government reports, are: ‹Weeds of Maine› (1869);

‘Ornamental and Useful Plants of Maine’ (1874); ‘Agricultural Grasses of Central Montana’ (1883); ‘Revision of the North American Melicæ’ (1885); ‘Grasses of Mountain Meadows and Deer Parks’ (1889); ‘Diseases of Plants’ (1885–6–7); and papers on ‘Grasses as Land and Soil Binders,’ and on ‘Grasses and Forage Plants’ (1894–1900). He has also published ‘The True Grass,’ translated from ‘Die natürlichen Pflanzenfamilien’ (1890).

La Navidad, lä nä-vē-däd′. See Navidad, La.

Lancaster, lăng′kăs-tėr, Sir **James,** English navigator: b. about 1550; d. London 9 June 1618. He served under Drake against the Armada, commanded the ‘Edward Bonaventure’ in the earliest expedition to the East Indies in 1591–4, captured Pernambuco in Brazil in 1594, and commanded the first fleet of the East India Company 1600–3. On his return home he was knighted. He was one of the original board of directors, and did much to promote the voyages of Weymouth, Hudson, and Baffin, in search of the Northwest Passage to India. The strait leading west from the north of Baffin Bay was in 1616 named Lancaster Sound by Baffin. See Lancaster Sound.

Lancaster, Joseph, English educator, the founder of the educational system bearing his name: b. London 25 Nov. 1778; d. New York 23 Oct. 1838. In 1798 he opened a school for children in Southwark, which he conducted on the Madras system, previously made known by Dr. Bell. (See Bell, Andrew.) The principal features of the system were the teaching of the younger pupils by the more advanced students, called monitors, and an elaborate system of mechanical drill, by means of which these young teachers taught large numbers at the same time. He soon found powerful support, and was able to erect a school-house, which in 1805 was attended by 1,000 children. The number of his patrons and the amount of subscriptions continuing to increase, he founded a normal school for training teachers in his system. He made extensive tours through Great Britain and Ireland, and in 1811 had founded 95 schools, attended by 30,000 children. He was reckless and improvident in his habits; became bankrupt, and emigrated to America in 1818, where he at first received some support, but ultimately fell into poverty. His family subsequently removed to Mexico, where his system was very popular, and where his grandchildren, bearing the name Lancaster-Jones, became prominent politically.

Lancaster, William Joseph Cosens, «Harry Collingwood,» English civil engineer and author: b. Weymouth 23 May 1851. He entered the British navy as a midshipman, but on account of defective eyesight resigned, and became a civil engineer, in that capacity visiting different parts of the world. Under the pseudonym «Harry Collingwood,» he is known to juvenile readers in England and America as the author of the popular nautical romances: ‘The Secret of the Sands’ (1878); ‘Under the Meteor Flag’ (1884); ‘The Pirate Island’ (1884); ‘The Congo Rovers’ (1885), a story of the Slave Squadron; ‘The Missing Merchantman’ (1888); ‘The Cruise of the Esmeralda’ (1894); ‘An Ocean Chase’ (1898); ‘The Castaways’ (1899).

Lancaster, Mass., town, and several villages combined, in Worcester County, on the Nashua River, and the Boston & Maine railroad; 18 miles north of Worcester. Here is the State Industrial School, a public library, numerous churches, high school, and manufactures of soap, brick, cotton goods, pumps, carriages, etc.; also large dairy and other farming interests. The town was first settled in 1651 by John Prescott, and it was here in 1676, that the Indians laid the place in ruins and killed 40 of the inhabitants. The town owns the waterworks. Pop. (1890) 2,200; (1900) 2,478.

Lancaster, N. H., town and county-seat of Coos County, on the Israel River, 126 miles north of Concord. The town is on the Boston & Maine and the Maine Central R.R.'s; and is a popular summer resort and residential section for New York and Boston people, being situated in an attractive part of the White Mountain region. It has manufactories of drugs, chemicals, lumber, wood-work, and machinery. The town owns and controls the waterworks. Pop. (1890) 3,373; (1900) 3,200.

Lancaster, N. Y., village in Erie County, on the New York Central & H. R., the Lehigh Valley, the Delaware & L. and Erie R.R.'s; 10 miles east of Buffalo. An important manufacturing centre containing iron-works, brass foundries, machine shops, glass-works, flouring-mills, brickyards, knife-works, and other industries. The waterworks plant is owned by the village. Pop. (1890) 1,600; (1900) 3,750.

Lancaster, Ohio, city and county-seat of Fairfield County; on the Hocking river and canal, and the Toledo, the Cincinnati and Muskingum Valley, and other railroads; 32 miles south of Columbus. It is the farming centre for the county; and is engaged in the manufacture of agricultural implements, foundry products, flour, glass, shoes, and has railroad shops and carbon works. It is the seat of the State Industrial School for Boys, Crawfis Institute, and the Columbia commercial school; contains a fine court-house, high school; four banks with a capital of $125,000; and many churches; and has electric light and street railroad plants; a good water supply; daily, weekly, and monthly periodicals; and an assessed property valuation of nearly $2,000,000. The city does an annual business amounting to $750,000. It was first settled in 1800 by Ebenezer Zane, and is governed by a mayor and a city council of seven members elected every two years. The city owns the waterworks and gas plants. Senator John Sherman and Gen. W. T. Sherman were born here. Pop. (1890) 7,555; (1900) 8,990.

Lancaster, Pa., city and county-seat of Lancaster County, on the Pennsylvania, the Philadelphia & Reading, and other railroads; 68 miles west of Philadelphia, and 37 miles east of Harrisburg. It is the manufacturing trade centre for the county; is an important tobacco market; and is engaged in tobacco growing, cigar-making, cattle raising, and the manufacture of cotton goods, iron and steel goods, shoes, and combs. It is the seat of Franklin and Marshall College; contains the Lancaster, Saint Joseph's, and the County Hospitals, Children's Home, Mechanics' and Y. M. C. A. libraries, and Conestoga Park, and has gas and electric light plants, electric street railroads, 12 National and State banks having a combined capital of $2,485,000; about 50 churches, and an assessed property valuation of over $16,000,000. The city was founded in 1718 by Mennonites (q.v.) and was called Hickory Town until 1730. In 1777 Congress sat here for a few days, and from 1799 to 1812 it was the capital of the State. It became a borough in 1742 and a city in March 1818. It is governed by a mayor elected every two years, and by a select council of 9 members and a common council of 27 members elected annually. Here was the birthplace of General John Fulton Reynolds (q.v.), and a monument has been erected to his memory. The municipality spends upward of $250,000 yearly in maintaining the public service. Pop. (1890) 32,011; (1900) 41,559.

H. E. Kennedy,
Editor of the ‹Morning News.›

Lancaster, S. C., town and county-seat of Lancaster County, on the Southern railroad, 84 miles north of Columbia. This is the shipping and trade centre of a large and fertile district devoted to the growing of cotton, tobacco, and grain. There are extensive cotton mills, machine shops, and other industries; public schools, two banks, and weekly newspapers. Pop. (1890) 1,094; (1900) 1,477.

Lancaster, House of, a name given in English history to designate the line of kings — Henry IV. V. and VI., immediately descended from John of Gaunt, fourth son of Edward III. Edmund, second son of Henry III., was created Earl of Lancaster and Leicester. His son Thomas added Derby and Lincoln to his titles, became leader of the baronial opposition to Edward II., and was beheaded for treason. His grandson was advanced to the dignity of a duke and, dying without male issue, the inheritance fell to his daughter Blanche, who became the wife of John of Gaunt. See also England.

Lancaster Sound, an outlet of Baffin Bay, in lat. 74° 20′ N., connecting it with Barrow Strait. Though this opening into the Arctic Ocean was discovered by Baffin in 1616, it was first navigated bv Parry in 1891. See Lancaster, Sir James.

Lance, a weapon consisting of a long shaft, with a sharp point, much used before the invention of firearms, and still in use. It was common among the Greeks and Romans. Frederick the Great formed an entire regiment of lancers. The Austrians followed, and soon established three regiments. After the partition of Poland, many Poles entered the French service, and a body of Polish lancers was established. The war with Russia, in which the efficiency of the lance in the hands of the Cossacks, particularly in 1812, was strikingly manifested, brought this weapon into still more repute, and the Prussians formed three regiments. The French lancers were formed in 1813 to cope with the Cossacks. Almost all the armies of Europe have had regiments of lancers. On 4 March 1903 the British War Office issued an order abolishing the use of the lance, in play as well as in work.

Lance'let. See Amphioxus.

Lancelot (lăn'sē-lŏt) **of the Lake,** a name celebrated in the traditions relating to King Arthur or the Round Table. Lancelot was the son of Ban, king of Brucic, and after his father's death was educated by Viviana (the Lady of the Lake). She took him to the court of King Arthur, to make him one of his knights, and to admit him to the heroes of the Round Table. Arthur with his sword (*Escalibor*) dubbed him knight, and Lancelot subsequently distinguished himself by his great heroism. His love for Guinevere, the wife of Arthur, and his disregard of Morgana, a fairy, and the sister of Arthur, placed the knight in the most dangerous situations, from which, however, he always extricated himself. He finally succeeded to the throne, after having defeated King Claudas, the murderer of his father, but was slain by Mordred, the murderer of Arthur, whom Lancelot wished to punish. In his last moments Viviana appeared, and kissed the last breath from the lips of the dying hero, the sole survivor of the Round Table. His remains were deposited near those of Guinevere.

Lancet-fish. See Surgeon-fish.

Lance'wood, the wood of a West Indian tree (*Oxandra virgata*, or *Bocagea virgata*), of small or moderate size, but of great usefulness and value, possessing in a high degree the qualities of toughness and elasticity. It is well adapted for the shafts and poles of light carriages, and for all uses where light, strong, elastic timber is required. Both in strength and elasticity it is considered superior to the best ash. The name is also applied to the trees themselves, as well as to several other trees and their wood.

Lanciani, Rodolfo Amedeo, rō-dŏl'fō ā-mā'dā-ō lăn-chä'ē, Italian archæologist: b. Rome 1 Jan. 1847. He was educated at the College Romano and the University of Rome, and in 1878 was made professor of Roman topography in the latter. He attained celebrity by his investigations among the ruins of Rome, and is a member of many learned societies. In 1887 he gave a course of lectures at Harvard University, afterward published with the title ‹Ancient Rome in the Light of Recent Discoveries› (1888). Other works of his are: ‹L'Itinerario di Einsiedeln e l'Ordine di Benedetto Canonico› (1891); ‹Pagan and Christian Rome› (1892); and ‹The Ruins and Excavations of Ancient Rome› (1897).

Land, in political economy. In economic theory as in social fact, land holds a peculiar position, by which the laws normal to other industrial objects are deflected. Foremost is the fact that, it being an indispensable *locus* for all industry or even social existence, its price or rental in a community where all the land is taken up is non-competitive, a monopoly which is also a *sine qua non*, as would be that of air or water; and consequently is always higher than its productive value justifies, or what is the same thing, men are content to receive a less return on their capital invested in it than in any other object. This is of course aggravated in countries where, as in England before 1832, all political privileges are annexed to it, the richest manufacturer having no vote unless he bought land and became a freeholder; less so, but still heavily, in England at present, where it and its tenantry confer great social and political prestige; but most of all in societies like the south of Ireland, where there is practically no industry but agriculture, and a footing on the soil at some terms is the one refuge from starvation. Farms there in former days were bid for on occasion at ten or a dozen times the gross annual produce, because there are no degrees in impossibility, and they could not in any event be deprived of a bare coarse subsistence. But the only countries in which it is on an economic level with other objects are those like America, where there has been an inexhaustible abundance of land to be had at about the cost of surveying and registering title; and here it has been the economic regulator of other prices and wages, which cannot fall below the profit of free agriculture.

The economic discussion over land in England, where freeholds are very difficult to acquire, naturally took the form of an investigation of the phenomena of Rent (q.v.); and an important part of the first economic philosophies was based on a theory of the origin and mutations of the rent charge. According to them, it could only exist where there were different grades of soils, and represented the difference in profit of farming better ones over that of farming those just sufficient to make their utilization worth while. In fact, however, even if all soils were alike, rent would still be paid for their hire if the labor and capital could produce more than the rental. Another principle early formulated, differentiating the working of land from other industries, was that of diminishing returns: it was said that labor and capital in any other field produce in exact proportion to their volume, whatever that be,— ten times the investment producing ten times the return,— whereas upon the land it is manifestly not so: extra labor produces but a small and rapidly dwindling accretion to the product, till it soon ceases to produce any. Here again there was imperfect observation: two plowings or hoeings would not produce double the crop of one, but double the outlay invested in manures or other fertilizers, loads of loam, etc., often produce very much more than a proportionate extra return. The real difference is, that in other industries the extra outlay can be applied in exactly the same channels, in land it must seek different ones.

Land in this sense refers purely to land used for raising food; where it has other uses, it is subject to the general laws of industry. Land, for instance, on which is located a water-power for manufacturing, or mineral land, if for sale, follows the usual mercantile conditions.

The subject of land belongs under Land Laws; of the single tax, under Taxation; of land nationalization, under Socialism, it being a branch of the question how far it would profit the country to place the entire social machinery under elected instead of self-determined managers; of agrarian difficulties, under the special branches of history concerned — the Roman agrarian contests, for example, shed little light on and are little illumined by the system of peasant distribution in France or the Irish land laws. For the methods followed in the United States, see LANDS, PUBLIC.

Land Banks, Massachusetts. Early in the 18th century, Massachusetts paper currency had driven abroad nearly all her coin, broken her credit, and demoralized her business; and the failure of the Quebec expedition in 1711 carried the embarrassment to a climax. Encouraged by the success of the South Sea scheme in England, some Boston merchants induced the General Court to make the bills of credit of the province legal tender for debts of seven years previous and three years subsequent. Besides this, a number of notable men, including Peter Faneuil, devised the scheme of a bank whose resources should rest on real estate mortgages, to make loans of its own notes; to encourage subscriptions, it was proposed that Harvard College should have $1,000 a year out of the proceeds. Gov. Dudley opposed it strongly; his son, the attorney-general, memorialized the General Court against it; and the latter forbade them even to print their scheme till they had laid it before the Court, which then refused to incorporate it. To ward it off and produce the same result, at Dudley's suggestion a public bank was founded, with a capital of $250,000 provided by the General Court, to lend bills of credit for five years at 5 per cent, one fifth to be repaid each year, the whole secured on real estate mortgages. In 1739, with the bad state of the finances increased by the still worse state created by the paper money of Rhode Island, and silver rated at 27 to 1, the project of a land bank was again brought forward. Several hundred persons were to form it; notes were to be issued up to $750,000, the security being a mortgage on each partner's real estate in proportion to his holding, or sureties also possessed of sufficient estate, and each partner paying 3 per cent on the loans made him, in bills or in kind, at a rate fixed by the directors. The House of Representatives was largely favorable; but Gov. Belcher denounced it as tending to fraud, disturbance of order, and confusion of business, and he set aside the election of the Speaker and nearly half the council for connection with the bank, besides displacing many office-holders. Despite this, the company began operations, expecting that the notes would circulate readily. They were mistaken: not over $300,000 were issued. But in 1741 Parliament not only extended to the colonies an act forbidding the issue of bills not payable in coin at the end of the term, but made the directors liable to the holders of the bills for their face with interest. As a large part of them had been issued at a discount, the partners (though many had little to lose) were threatened with ruin, and Parliament had to permit relief measures. One of these partners, who lost all his property, was the father of Samuel Adams.

Land Crabs. Almost all shore-crabs will withstand exposure to the air for some hours without suffering injury, and many of them are regularly so exposed at ebb tide. It is not surprising, then, that some of them have wandered far from the seashore into the fresh-water streams and the moist woods and mountain forests, or even largely forsaken the vicinity of water and established themselves on dry hillsides. The land crabs, par excellence, belong to the family *Gecarcinidæ*, in which the carapace is thick and hard, strongly arched above, rounded, bent downward and truncate in front, and vaulted in the branchial region. The branchial chamber is spacious and lined by a spongy membrane which retains moisture for a long time and thus keeps the gills damp. Six or seven genera and several species inhabit the warmer regions of both hemispheres. One species (*Gecarcinus ruricola*) is common on many of the West Indian islands, is excessively abundant on some of the Bahamas and occurs in southern Florida. They abound at the eastern end of Cuba, and were a source of immense annoyance to the inexperienced soldiers of the United States army in the campaign of 1898 against Santiago de Cuba. On Jamaica and the other larger islands they inhabit a zone in the hills from one to three or four miles from the shore, where they live in burrows beneath stones or under the roots of trees, from which they emerge at night to seek their chiefly vegetable food. They are large, robust creatures with extremely powerful claws, which a pugnacious disposition leads them to use freely. Mating takes place in the spring, and during the rainy season in May a common impulse causes them to migrate in vast armies to the sea, where they bathe and deposit their eggs, which are washed up and buried in the sand by the waves. There is no metamorphosis, but the young develop directly and hatch in nearly the adult form. By resident naturalists and travelers who have observed it, this animal's march to the sea is described as a most impressive sight. Most of the males form an advance guard which is followed in two or three days by the females and remaining males. They are said to proceed in a direct line and to climb over, instead of passing around, every obstacle, even houses. After discharging the eggs, bathing, and resting, the crabs return to the hills and in midsummer close their burrows with leaves, grass, etc., and retire to their inmost recesses to moult. At this time, while in the soft-shelled state, they are in high favor for the table, and are dug out of their burrows in large numbers by the natives. A related species (*Ucauna*), the Brazilian mangrove-crab, is remarkable for the regular inspiratory and expiratory changes of the air in the branchial chamber.

The *Thelphusidæ* are river crabs rather than land crabs, but a number of species inhabit the damp forests of warm countries. In Japan a well-known species (*Thelphusa dehaanii*) is frequently met with in the mountains at an elevation above 2,000 feet. Some terrestrial species are mentioned in the article HERMIT CRAB.

Consult: Brown, 'Civil and Natural History of Jamaica'; Young, 'West Indian Stalk-eyed Crustacea'; and Rathbun, 'Proceedings of the U. S. National Museum' (1899).

Land Grant, a concession or subsidy made by the United States Congress to assist railroad companies to secure funds, by the sale of bonds secured by lands so granted, to construct lines of railway through parts of the United States where the local traffic would not pay the running expenses. About 215,000,000 acres of land were given to the various railroads of the country by the government. The Illinois Central received a strip of land 12 miles wide, running the whole length of Illinois; the Northern Pacific received 47,000,000 acres; the Atlantic and Pacific, 42,000,000; the Union Pacific, 13,000,000, and other roads in proportion.

Land League, an Irish organization founded by Charles S. Parnell, which came into being at a meeting held in Dublin 18 Nov. 1879. The principal tenets of the association were the «three F's»—fixity of tenure, fair rent, and free sale (of the tenant's interest); but many speakers at Land League meetings, held in different parts of the country, went so far as to demand that the soil should belong to the cultivator. Opposition by direct violence was deprecated, and recourse was had to boycotting. (See BOYCOTT.) This state of things continued till the end of 1880, when 14 members of the Land League, of whom the most important were Parnell, Dillon, Biggar, T. D. Sullivan, and T. Sexton, were indicted. The chief counts were «conspiring to prevent payment of rents, to defeat the legal process for the enforcement of payment of rents, and to prevent the letting of evicted farms.» The trial, which took place early in 1881, was a fiasco, but it drew from Justice Fitzgerald the declaration that the Land League was an illegal body. A Ladies' Land League, under the presidency of Miss Anna Parnell, was then formed. It was denounced by Archbishop McCabe, and warmly defended by Dr. Croke, archbishop of Cashel, and T. D. Sullivan. The agitation increased, and the «No Rent» cry became more frequent. Gladstone denounced Parnell, and soon afterward Parnell, Dillon, Sexton, O'Kelly, and the chief officials of the League, were arrested and imprisoned in Kilmainham. They issued a manifesto calling on the Irish tenants to pay no rent during their imprisonment. The government replied by declaring the Land League an illegal body, and suppressed its branches throughout the country. The Ladies' Land League continued until the close of the year, when it was dissolved by the leaders of the Irish party. See IRELAND.

Land-locked Salmon, a salmon which inhabits an inland body of water, and can never go and come to the sea. The term applies in America only to salmon inhabiting certain lakes in eastern Canada and northern New England; and whether these salmon should be regarded as distinct species or merely as representatives of the Atlantic salmon modified to suit their local conditions, is a question upon which ichthyologists are not agreed. It is most convenient to follow the distinctions made by sportsmen, and regard the land-locked salmon as two species, the Sebago salmon and the ouananiche (qq.v.).

Land Office, United States, the department charged with the management and disposal of the public lands. For its constitution and history, see LANDS, PUBLIC.

Land-snail, an air-breathing terrestrial gasteropod mollusk, or snail of the family *Helicidæ* or some nearly related pulmonate. These mollusks possess a well-developed, usually globose and more or less spiral, horny and brightly colored shell (except in slugs, q.v.), into which the whole animal may be withdrawn, and which has, usually, a lunate aperture, not closed by an operculum. Four retractile tentacles exist, the upper pair being the larger and possessing eyes at their tips. A distinctly developed so-called «foot» is present. The aperture by means of which air is admitted to the lung-chamber for the purpose of breathing exists on the right side, under the edge of the shell. The mouth possesses an upper mandible of horny consistence and toothed structure, and, as in other gasteropods, there is a tongue or lingual ribbon bearing many teeth. The food is generally of a vegetable nature, and snails are capable of doing great mischief in gardens, but none in the United States is noticeably harmful. The sexes are united in the same individual; but the copulation of two such hermaphrodite individuals is necessary for impregnation, which becomes mutual. The eggs are globular or oval, have coriaceous shells, and are laid singly in damp places, as under leaves, stones, etc.; *Bulimus* (q.v.) is noted for the comparatively large size of its eggs. These eggs and the snails themselves are eaten by birds, turtles and other enemies, especially in the tropics, where land-snails are more varied, numerous and conspicuous than in temperate regions. Some species, however, live in very cold climates, far to the north or high on mountain ranges. Those of cold climates hibernate in winter, creeping into sheltered places, and closing the aperture with one or more air-tight drum-head-like curtains of hardened mucus. In hot and dry places they protect themselves in midsummer against undue loss of moisture in the same manner.

The family Helicidæ, which embraces not only the terrestrial genus *Helix*, but the bush-climbing, long-spired *Bulimus* (q.v.), and several smaller genera, includes thousands of species. Specimens are always most numerous in moist woods and in a limestone region than elsewhere. Many small terrestrial mollusks, properly called land-snails, belong to families other than *Helicidæ*, as the *Orthalicidæ, Bulimulidæ*, and *Pupidæ*, the last containing many minute American species, not larger than a pin-head, shaped like a grain of rice, and beautifully chased; *Stenogyridæ*, in which are found the great agate-shells (*Achatina*) and sundry others of the tropics; *Succineadæ*, represented by many small, glassy expanded forms of great beauty; and others, some of which contain shell-less and slug-like forms.

Utility of Snails.— Snails have been made of use medicinally in the past, and curative virtues are still attributed to them among European peasants. Among the Romans snails were held in high esteem as articles of food and even of luxury; and special parks or establishments named «cochlearia» were constructed for the purpose of fattening these mollusks. The practice of eating snails has never been very common in England, but Howard, the prison philanthropist, tried to encourage it. Howard cultivated the *H. varronis*, the largest of European species. In modern Europe, as in many parts of France, and in Vienna, especially during Lent, snails are largely consumed, especially among the lower orders. The proletariats of Naples are exceedingly fond of a soup made from *H. nemoralis*. The most valued species among modern epicures is the *H. vermiculata* or little hermit snail, found at Montpelier; and *H. aspersa*, the «garden-snail» of the English, is also regarded as very delicate when properly cooked. *H. pomatia* has a wider range as an edible snail, especially in France, where this species is extensively cultivated for market in appropriate enclosures called *escargotières;* thousands are also gathered from the vineyards and sold in the larger towns of southern France. It is imported in pickle to the United States, and finds extensive sale.

Bibliography.— Consult: Lovell, ‹British Edible Mollusks›; Cooke, ‹Mollusks› (Vol. III. Cambridge Natural History, 1895); Binney and Bland, ‹Land and Fresh-water Shells of North America.›

Land of Steady Habits, a phrase applied to the State of Connecticut.

Land Surveying. See SURVEYING.

Land-tortoise, a terrestrial turtle of the family *Testudinidæ*, order *Cryptodira* (see CHELONIA), a family characterized primarily by the possession of a strong box-like shell, completely ossified when young and covered with horny shields, into which the whole body may be withdrawn and in some forms wholly enclosed. The family also contains aquatic and amphibious forms (see POND-TURTLES; TERRAPIN), but these need not now be considered. American representatives are found in the box-turtles (properly so-called) of the genus *Cistudo*, in which the plastron is connected with the carapace by ligaments and is divided into two movable lobes, the transverse hinge being so perfect that the box can be completely closed after head, legs and tail have been withdrawn. The carapace is high and arched. The common box-tortoise of the United States (*C. carolina*) has become completely terrestrial, and has undergone some interesting structural modifications in consequence, among others a loss of webbing between the toes. It reaches about six inches in length, is highly variable in the arrangement of the blackish and reddish tints of its coloration, and each dorsal shield is nicely sculptured in concentric rings, but these become worn nearly smooth in old age. They wander about the woods, walking with the shell well lifted from the ground, and searching for food most diligently in the evening and early morning and in moderate and moist weather. Their food consists chiefly of snails, slugs, earthworms, crayfish, grubs, and the like, together with fungi and a little green stuff. In winter they hibernate, buried in soil or garden rubbish. They are fond of staying in one limited district, are easily tamed and exhibit some intelligence, but individuals differ much in these respects.

The typical land-tortoises, however, are those of the genus *Testudo*, in which the plastron has no hinged, folding part, and the feet are short and webless. The 40 or more species are scattered throughout the warmer parts of the world, excepting in Australasia. The small, convex, highly sculptured «Greek» tortoises of Europe and North Africa, so often kept as garden pets, are familiar representatives. They feed almost wholly upon green grass, leaves and vegetables. The captive made famous in Gilbert White's ‹Natural History of Selborne› was one of these (*T. ibera*), and its shell is now preserved in the British National Museum. The gopher tortoise (q.v.) of Florida is a North American species; and a similar widely spread South American species (*T. tabulata*), which lives mainly on forest fruits, is often two feet long.

Gigantic Land Tortoises.— Certain terrestrial tortoises of very large size survived until the historic age, and in some cases still exist, on islands in the Indian and Pacific oceans. They are relics of a bygone period, when even larger ones prevailed. Fossil bones in Miocene and Pliocene strata of India, western North America and other parts of the world, indicate tortoises of that period whose heads alone must in life have been nearly a foot in length, and beside those giants even the largest of the modern species so-called would look small. The presence of such turtles gave their name to the Galapagos (q.v.) group of islands off the coast of Ecuador, where each of the large islands of the archipelago supported a separate species, but all resembled one another in the relative small size of the head and great length of the neck. «The most peculiar looking are or were *T. ephippium* and *T. abingdoni*, the shell of which is extremely thin, with large lacunæ in the osseous plates. The profile of the shell is saddle-shaped, with the horny shields partly concave and turned upward at the sides. The general color of these and other Galapagos tortoises is black.» Toward the close of the 19th century all that remained of these tortoises were caught and distributed alive to various parks and zoological collections in North America and Europe, where they will be cared for and will probably continue their race. They eat grass and leaves of succulent plants, as lettuce; their food in the Galapagos having been mainly cactus and a lichen (*Usnea*).

Other giant tortoises inhabited the islands of the Indian Ocean until within the historic period, and a few remain in captivity. In 1898 there was still living in England a specimen of *T. sumeiri*, once existing in thousands on the Seychelles, whose history was known since 1766, when it was already of large size. Other species inhabited Madagascar, where they became extinct prehistorically, Bourbon, Mauritius and Rodriguez. They were utilized as food by the voyagers of the 17th and 18th centuries; were wastefully slaughtered by the European colonists, and carried in shiploads from island to island, until at last none remain but a few captive specimens.

Consult: Günther, ‹Gigantic Land Tortoises› (1877); Gadow, ‹Amphibia and Reptiles› (1901); Baur, ‹American Naturalist,› Vol. XXIII. (December 1889).

Lande (Fr. länd), in France, a name given to a sandy plain unsuited for bearing grain. From the vast extent of landes (about four fifths of the total area) which it contains, the third department of France, in point of size, derives its name. The landes lie to the north of the Adour, while the country to the south of that river is fertile. Of the whole area (about 2,250,000 acres), nearly one half is waste, a third under wood, and little more than a sixth arable. The landes are very thinly populated, the inhabitants gaining subsistence by fishing, by such agriculture as is possible, and by keeping cows and sheep. The shepherds make use of stilts, that their increased height may give them a greater range of vision, and, when fatigued, sit on a pole with a head somewhat like that of a crutch, and while away the time in knitting.

Lan'der, Frederick West, American military officer: b. Salem, Mass., 17 Dec. 1821; d. Paw Paw, Va., 2 March 1862. He was educated at the Norwich (Vt.) Military Institute, and became a civil engineer. He was employed in making surveys across the continent by the United States government for the purpose of finding a suitable route for a transcontinental railroad and served in the Army of the Potomac in the early part of the Civil War.

Lander, Jean Margaret (Davenport), American actress: b. Wolverhampton, England, 3 May 1829; d. August 1903. Her stage career began in childhood, and her parents brought her to this country in 1838, where she played for four years, then traveled in Europe (1842–8), playing as Julia in ‹The Hunchback› in England and on the Continent, returning to the United States in 1849. She acted with great success in the principal cities until 1860, when she married Gen. Frederick West Lander (q.v.) and retired from the stage. After his death in the Union army in 1862, Mrs. Lander joined the Hospital Corps of the army, and for more than a year she and her mother were in charge of the hospital at Port Royal, S. C. After the War she returned to the stage and again enjoyed great popularity in a number of important roles, some of which she originated in this country. Her final appearance was made in Boston in 1877, in an adaptation of ‹The Scarlet Letter.›

Lander, Louisa, American sculptor: b. Salem, Mass., 1 Sept. 1826. In early youth she manifested her taste for sculpture by modeling heads for dolls, and carving bas-reliefs on alabaster and other soft substances. As she grew older she modeled likenesses of members of her family, and executed cameo heads. She went to Rome in 1855 and became the pupil of Crawford, and soon after finished in marble ‹To-day,› a youthful figure emblematic of America, and ‹Galatea.› Among her subsequent works are: a bust of Hawthorne; a spirited statuette of Virginia Dare, the first English child born in America; a life-size statue of Virginia; a reclining statue of Evangeline; ‹Elizabeth, the Exile of Siberia›; a statuette of Undine, and one of ‹Ceres Mourning for Proserpine›; numerous portrait busts; ‹A Sylph Alighting›; and ‹The Captive Pioneer.› She was a sister of F. W. Lander (q.v.).

Lander, Richard, English African explorer: b. Truro 8 Feb. 1804; d. Fernando Po 6 Feb. 1834. He became a domestic servant; in that capacity accompanied Captain Hugh Clapperton as his servant on his second expedition into the interior of Africa 1825. After Clapperton's death in 1827 he returned to the coast, and in 1829 published ‹Records of Captain Clapperton's Last Expedition to Africa.› In the spring of 1830 he set out with his brother John on an exploring expedition, under the auspices of the English government, and from Badagry, near Cape Coast Castle, they proceeded to Boossa on the Niger, and after ascending the river for about 100 miles, traced its course downward to the sea, and proved that it entered the Bight of Benin by several mouths. They were the first also to discover that it was fed by the Benue. Their journal was published in 1832, entitled ‹Journal of an Expedition to Explore the Course and Termination of the Niger,› and was translated into several languages. While on a trading expedition in the delta of the Niger, he was wounded by the natives, and died soon after.

Land'grave (German *Landgraf*), a title assumed by certain territorial counts of the German empire to distinguish them from the inferior counts. There were originally three landgraves, those of Thuringia, and of Upper and Lower Alsace, who were princes of the empire. The title was assumed by Louis III. of Thuringia about 1130.

Landlord and Tenant, the relation of renter to rentee; not necessarily of land, except as all dwellings or industries must have land for a *locus* (see Land, in Political Economy), but of any of its material incumbrances. The landlord need not be the owner: he may himself be a lessee or tenant granting occupancy or use to a sub-tenant. It is sufficient that his title is superior to that of the one who holds through him. The difference between the latter's interest and that of the landlord is known as the reversion of the latter; but there is obviously no reversionary interest unless the grant is specifically limited to a less volume than the grantor's, and none unless it is inferior in kind. Historically, the relation originated in the practice of infeudation in the Middle Ages, when all holdings were a chain of vassalships, when even kings did homage for portions of their possessions, and no property was held by any but kings, except as vassal to some overlord. The feudal incidents were abolished by the English statute of Quia Emptores in 1290. The modern mercantile relation of lessors and lessees is the creation of statute, judicial decisions, and the specific agreements of written contracts.

The mutual obligations of the contracting parties in law are natural consequences of the relation. The landlord on his part must protect the tenant from any other claim of occupancy; must not evict him or suffer him to be evicted, and if he does either, is liable in damages. He is not, however, under any obligation to protect him against violence, trespass, nuisances, or other unlawful acts of outsiders; nor to furnish habitable buildings, usable implements, or anything whatever of specific quality unless specially agreed on. The doctrine of *caveat emptor* is also extended to *caveat lessor;* he must form his own conclusions and run his own risks. The tenant cannot question or interfere with the landlord's title, even if the latter be worthless: his own is derived from it, and must stand or fall with it. Nor does any length of occupancy enable him to plead the latter in bar of the landlord's right, by the statute of limitations, under common law; but he very generally can by statute after a certain period, though never till the period of his tenancy has expired. Of old the feudal tenant could do at once much more and much less than this: he could not under any circumstances get the landlord's property into his own hands, but by a legal fiction of which the law sanctioned the use (feoffment or common recovery), he could grant to a third party what he did not himself own, so that the third party could retain it; the wrongful grantor, however, forfeited his own estate to the landlord. Statutes long since abolished these fraudulent conveyances.

The tenant must keep the premises in repair; if he lets them go to ruin or deteriorate from non-use he is liable in damages. By common law he must rebuild premises destroyed by fire; most States of the Union abrogate this right, however. The tenant must not commit waste; but he may cut wood for fire, repairs, or fencing, and if he is a tenant at will or for life he has a right to the crops.

Obligations by agreement may of course be almost anything. Stipulation of rent usually forms a part; permission to make improvements not to be removed is most usual, sometimes obligation to make them of certain sorts; and an agreement not to assign the lease without the landlord's permission. The landlord may agree to renew the lease or to pay for improvements, or permit removal of fixtures, etc. An agreement to pay a reasonable rent has been held to be implied without being specified in the lease. All such rights and duties extend to the successors to the parties, including assignees.

Landois, läṅ-dwä, **Hermann,** German zoologist: b. Münster, Germany, 19 April 1835. He studied for the priesthood, but in 1859 turned his attention to science, and in 1873 was appointed professor of zoology at the Academy of Münster. He is the author of ‘Sound and Voice Apparatus of Insects’ (1867); ‘Text-Book of Zoology’ (1870); ‘Text-Book of Botany’ (1872); ‘Voices of Animals’ (1875); ‘Text-Book of Instruction in the Description of Nature’; and other popular works of a like character.

Landois, Leonard Christian Clemens, German physiologist: b. Münster, Germany, 1 Dec. 1837. He is a brother of H. Landois (q.v.), and was educated at the University of Greifswald and has been professor of physiology there from 1872. He is widely known as an original investigator and has published: ‘Le Diagnostique des Maladies des Yeux’ (1877); Manuel d'Ophthalmoscopie’ (1878); ‘Traité complet d'Ophthalmologie’ (1886); ‘Lehrbuch der Physiologie’ (10th ed. 1899); etc.

Lan'don, Letitia Elizabeth, English poet, better known by her initial signature «L. E. L.»: b. Chelsea, England, 14 Aug. 1802; d. Cape Coast Castle, Africa, 15 Oct. 1838. She wrote much for the then fashionable annuals, and was long popular both as poet and prose writer. In June 1838 she was married to a Mr. George MacLean, and sailed with him to Cape Coast Castle in Western Africa, where he was governor. She died there soon after her arrival, from an accidental over-dose of prussic acid, which she had been in the habit of using medicinally. Her chief works are: ‘The Improvisatrice and Other Poems’ (1821); ‘The Golden Violet’ (1827); ‘The Venetian Bracelet’ (1829); ‘Ethel Churchill,’ a novel (1831); and ‘Romance and Reality,’ a novel (1837).

Landon, Melville de Lancey («Eli Perkins»), American author: b. Eaton, N. Y., 7 Sept. 1839. He was graduated at Union College in 1861, and soon after joined the Union army, from which he retired in 1864, having reached the rank of major. He became a cotton-planter in Arkansas and Louisiana, traveled in Europe, and was for a time secretary of the United States legation at St. Petersburg. His writings have made him known chiefly as a humorist, but have dealt with serious as well as lighter subjects. He has published: ‘Saratoga in 1901’ (1870); ‘History of the Franco-Prussian War’ (1871); ‘Wit, Humor and Pathos’ (1875); ‘Wit and Humor of the Age’ (1880); ‘Kings of Platform and Pulpit’ (1887); ‘Thirty Years of Wit’ (1890); ‘Eli Perkins on Money — Gold, Silver or Bimetallism’ (1895); and other works.

Lan'dor, A. Henry Savage, English traveler and painter: b. Florence, Italy. He is a grandson of Walter Savage Landor (q.v.), and has traveled in eastern Asia, America, Australia and Africa. Among his writings are ‘Alone with the Hairy Ainu’; ‘Corea, or the Land of the Morning Calm’; ‘A Journey to the Sacred Mountains of Siao-on-tai-shan’; ‘China and the Allies’ (1901).

Landor, Walter Savage, English poet and prose writer: b. Ipsley Court, Warwickshire, 30 Jan. 1775; d. Florence, Italy, 17 Sept. 1864. He was educated at Rugby and Oxford, from the latter of which he was rusticated in 1793 for breach of discipline and never returned. He published a small volume of poems in 1795, and a long poem, ‘Gebir,’ in 1798. This latter he subsequently translated into Latin verse, being one of the most accomplished Latinists of his time. He succeeded to a large property on the death of his father, but sold it off, determining to live abroad. In 1808 he raised a body of men at his own expense for the defense of Spain against France. In 1811 he married and settled at Florence, where many of his works were written. Having separated from his wife he returned to England in 1835. In 1858 he went back to Italy, which henceforth remained his home. His fame chiefly rests on his ‘Imaginary Conversations’ between celebrated persons of ancient and modern times, which is a model of a pure, vigorous, finished English style. Among his other works are: ‘Count Julian,’ a tragedy (1812); ‘Hellenics’ (1847); ‘Pericles and Aspasia,’ imaginary letters (1836); ‘Pentameron and Pentalogue’ (1837); and the dramas ‘Andrea of Hungary’ and ‘Giovanna of Naples.’ Consult Life by Forster (1871); Colvin, ‘Landor’ (1881).

Land'rail. See Corncrake.

Lan'dreth, Burnet, American agriculturist: b. Philadelphia 30 Dec. 1842. He was educated at the Polytechnic College, Philadelphia, was captain of infantry during the Civil War, serving in the Army of the Potomac, and since the war period has devoted himself to the promotion of higher agricultural and allied interests in many important fields of service. He was chief of the Bureau of Agriculture at the Centennial Exhibition, director-in-chief of the American Exhibition in London, and is a member of many American scientific societies; also holds honorary membership in similar bodies in European countries, in India, and in Japan; and is Chevalier and Officier du Mérite Agricole de France. He founded and is president of the Association of Centenary Firms of the United States, and is head of the seed-house of D. Landreth & Sons, established in 1784 in Philadelphia. He has published several works on agricultural subjects.

Landry, Auguste Charles Philippe Robert, Canadian author and statesman: b. Quebec 15 Jan. 1846. He was graduated from Laval University in 1866; then took a course in agricultural science at the College of Sainte Anne, and devoted himself to farming. He served for several years in the militia, rising to the rank of lieutenant-colonel. In politics he is allied with the Conservatives; he was a member of the Quebec Assembly 1875–6; was elected to the Canadian House of Commons in 1878, where he served till 1887, when he was defeated at the general election; in 1892 he was called to the Senate. He became president of the Quebec Exhibition Company in 1894, is a member of several agricultural societies, and was elected president of the Council of Agriculture in 1896. He has written ‘Traité populaire d'Agriculture théorique et pratique’ (1878); ‘L'Église et l'Etat’ (1883); and numerous papers on political and scientific subjects.

Lands, Public. The subject may be divided into five sections: (1) The acquirement of the lands by the nation; (2) the objects and methods of disposal; (3) the manner of acquirement by individuals; (4) the government system of management; (5) general statistics.

1. The 13 States as finally delimited contained 341,752 square miles, increased by the treaty of peace with Great Britain to 830,000. Their Western lands *in posse* were ceded to the general government as a common possession and trust fund, first by New York to remove obstacles to the formation of the Confederation (q.v.); then by the rest of the northern States and Virginia before the adoption of the Constitution; the others gradually followed, Georgia coming last in 1802. It was understood, and is implied in the Constitution, that this was eventually to be erected into States; but meantime Congress must decide on their disposal to the settlers who were ultimately to form those States, and could reserve as *enclaves* within the States whatever tracts it chose. The Ordinance of 1787 (q.v.) is a monument to its action in administering the territory north of the Ohio. For the further accessions to our territory, see Annexation. But after these State or treaty cessions, there still remained Indian claims to vast tracts, which could only be quieted by purchase or war, and in fact required much of both. Great tracts were bought, and the Indians who refused to remove from the remainder east of the Mississippi were gradually deported beyond it. (See Indian Territory; and for the most extreme case of forcing a removal, Cherokees and Cherokee Case.) The reservations have embraced in all more than 100,000,000 acres, but have themselves later been largely thrown open to settlement, by purchase from the Indians.

2. The first thought in handling the public lands was revenue: «to effect a gradual discharge of the domestic debt, and furnish liberal tributes to the federal treasury» (‘Federalist’). As the country grew richer this policy was abandoned, and two others took its place,— to induce settlement of the territory, and to provide funds for public uses where general taxation would have been unpopular or perhaps unconstitutional. The latter have included grants to private individuals for eminent public services, to educational and charitable institutions direct and to States for them, to public improvements like roads, canals, and railroads, and to States for them (the latter first), and lately for a giant irrigation fund.

The first policy naturally led to its being sold to syndicates in vast tracts; the price, at first fixed at a minimum of $1 per acre, was reduced to 66⅔ cents, and two great sales were made in Ohio, to a New England and a New Jersey company. The second resulted in Cincinnati, but its 1,000,000 acres conflicted with Indian and military reservations, and only 310,000 acres were actually sold. This policy aroused great discussion: some claimed that the land should be sold to settlers in such lots as they wished; others declared that if so done the Eastern States would be depopulated,— the States were already bidding against each other to sell their own lands, Massachusetts offered Maine lands at 50 cents an acre to check western emigration, and the Illinois Spaniards offered theirs for nothing with a temporary exemption from taxation, and stocked at that. Hamilton made a classic report in 1790, the basis of an important part of the present system, and in 1796 Congress voted to sell the lands in quantities a mile square at $2 an acre. Up to 1801 the total sales were 1,484,047 acres, all in Ohio. But the sales were so slow at the last that in 1799 nothing was turned into the treasury from this source, and in 1800 only $443. In May 1800 a credit system was introduced, one fourth down and the rest in three years. The result was a great increase in sales, but also in so much chance speculation that a large part of the payments were defaulted, Congress disliked to oust the settlers, and relief acts were regularly passed for many years. In April 1820 the credit system was abolished, and lands sold for cash in lots as small as 80 acres, at $1.25 per acre. The debts still owed were over $21,000,000 in December 1820; they were not wholly discharged — partly through payment for arrears and more by relinquishment of lands — till 1830. Under the new system, by 1840 the sales had been some 76,000,000 acres. After the panic of 1837 the pre-emption system (see Section 3) was introduced, with a bitter fight,— as it was thought to encourage speculators, intruders, and squatters, who would not pay until forced,— and for some years it was confined to special licenses which were really relief acts for previous settlers. In September 1841 a permanent pre-emption act was passed, supplemented by the act of 5 March 1843. This was confined to surveyed lands; in 1853-4 it was extended to unsurveyed ones, so that intending settlers could take their choice of the best lands everywhere. In 1854 a Graduation Act (q.v.) was passed, to sell off cheaply lands which had been long in the market. From 1852 on a homestead law was one of the platform issues; first to grant 160 acres free to any settler, then to charge 25 cents an acre after five years, finally passed in 1862 substantially as at present,— five years' continuous residence and improvement on a quarter-section, and then a free patent. The results of this policy are given in the final paragraph. The pre-emption law has recently been repealed on account of the shameless collusive frauds on the government. In 1878 a Timber Culture Act was passed, granting not exceeding 160 acres to any one proving that he had planted 150 acres of timber; this, too, has been repealed.

Of the gifts, the chief personal ones were in bounties to the Revolutionary soldiers and to those of the War of 1812, and to a few individuals like Lafayette. After the Mexican War, some 60,000,000 acres was given in bounties to soldiers and officers. Grants were also made to those who would take land on specified frontiers, to form a buffer settlement. The grants for public improvements have been lavish. The first were wagon roads; then came canals, for which over 4,000,000 acres were granted in five States between 1824 and 1866; then by act of 1850, all swamp and overflowed lands within the bounds of any State were granted it as a fund to construct dikes and drainage. The first railroad grant was made to Illinois in 1850 to construct the Illinois Central Railroad; as ever since, alternate sections of land on each side were given. Several scores of others have been given to other States. The greatest gift of the sort, however, was for the construction of the Union Pacific Railroad, which had to be given direct because the lands for many hundred miles were in districts where no States had arisen. (See Credit Mobilier of America.) About 155,000,000 acres were granted in all, but some reverted to the government for failure to fulfil conditions. The educational gifts have been great: the States admitted previous to 1850 had 1-36 of their area reserved for a school fund, those since then 1-18, some 70,000,000 acres altogether; in 1862 each State had a tract proportional to population for an agricultural college — about 10,000,000 acres; each of the last six States has been granted a tract for a university, over 1,000,000 acres in all, with other gifts for education, public buildings, etc., amounting to 25,000,000 acres in all. Finally, in 1902 the entire receipts from the sale of lands in 17 States and Territories were set aside as an irrigation fund, calculated ultimately to produce several hundred million dollars.

3. There are several methods by which private entry has been made on public lands. The pre-emption law, recently repealed on account of fraud, allowed any one to receive a full title to 160 acres of land after six months' residence and improvement, on paying $1.25 an acre; there were several exceptions to the lands that might be taken, and no one who already owned 320 acres, or who deserted his own land to take up the new, was entitled to the privilege. Despite this, it has been a huge engine of fraud: its excuse being that it was for many years the only way in which the unoccupied lands could be settled up. Less rapidity of settlement might not have been injurious. The Homestead Acts (q.v.), five years' residence and no payment, made the same exceptions of land and persons, otherwise both were the same as under the former system. This affords far less chance of fraud, and is the one system now in use. Another method is to announce a public auction to the highest bidder at $1.25 an acre, the unsold part being retained for private sale. Military land warrants to soldiers or their families are another method. The Timber Culture Act, now repealed, has been mentioned.

4. The General Land Office classifies its lands in seven divisions: (1) Agricultural lands. These are rated either as «double minimum,» within a specified distance of works of internal improvements, and sold at $2.50 an acre; or minimum, at $1.25 an acre. (2) Town sites: either sold at public auction for $10 an acre, or inhabitants of cities or towns granted the privilege of entry at $1.25. (3) Mineral lands, varying from placer locations at $2.50 an acre to

mining rights at $5; not to exceed 1,500 x 600 feet, nor go below 1,500 x 50, thus varying from 20.66 to 1.72 acres. (4) Timber and stone, unfit for cultivation, 160 acres limit, $2.50 an acre. (5) Saline, containing salt springs; offered first at public auction for $1.25 an acre, then held for private sale at the same price. (6) Coal, limit of 160 acres to a person and 320 to a company, save that the latter (if at least four persons) on expending $5,000 can enter 640 acres more; $10 an acre if over 15 miles from a railroad, $20 if less. (7) Desert, limit 640 acres, price 25 cents on entry, with an affidavit of intending to irrigate it within three years; which done, $1 an acre more secures a full title.

The method of survey is the rectangular system, devised by Jefferson; under which an immigrant can travel a thousand or two thousand miles into a new territory and find his farm without delay or doubt. It was adopted in 1785; the township of six miles square and the section of one mile were Monroe's suggestion. A base line and meridian line are first determined; and from the former, townships of the above size are established, and numbered north and south. From the meridians chosen, ranges a mile square are charted, and numbered east and west of the principal meridian. Thus, «Northeast quarter of Section 11, Township 17 south, Range 3 west of the fourth principal meridian,» can be reached at once; and boundary marks being always placed at the intersection of divisional lines, the special farm can be determined without trouble. The first principal meridian established was that dividing Ohio and Indiana, with the Ohio River as its base, and the meridian 84° 51′ west. This controls surveys in Ohio. Since 1785, 24 initial points (intersection of principal bases with surveying meridians) have been used.

These lands are under control of the General Land Office at Washington; a bureau first established in the Treasury Department 25 April 1812, placed under presidential control in 1836, and transferred to the Interior Department on its organization in 1849. The head is the commissioner. It issues and records all government land patents, whether on private claims, congressional grants, or any other ground; there are three chief clerks (of surveys, of public lands, and of private claims), a presidential secretary to sign land patents and affix the official seal (a duty formerly discharged by the President), and a recorder to countersign them,— all appointed by the President and confirmed by the Senate. The commissioner makes annual report to Congress; and the office issues maps showing government reservations and unappropriated lands, circulars of information, etc., besides auditing all accounts relating to these lands. The commissioner and all employees of the office are forbidden to deal in the public lands directly or indirectly. There is also a State land office established in each State with more than 100,000 acres of unsold lands, each having a register and a receiver appointed by the President for four years; the former receives applications and issues patents, the latter receives and receipts for the money. In 1902 there were 115 district land offices, and 17 surveyors-general.

5. In 1902 (June 30) the total amount of public domain lands from the first had been 1,809,539,846 acres (2,827,406 square miles). Of this, the amount now surveyed and ready for sale was 301,979,307, unsurveyed and unappropriated in Alaska 367,983,506, outside of Alaska 223,992,663; reserved, 151,161,638; appropriated, 764,422,726. Of course a very large part of these unsurveyed lands are mountain or moor, permanently unavailable; but a great quantity is still left worth appropriating. How rapidly this is being taken up will be shown by the following table of operations at the General Land Office for the past five years (year ending 30 June):

	No. original Homestead Entries.	No. acres sold.	Cash sales.
1898..........	44,980	8.453,896.92	$ 2,277,995.18
1899..........	45,776	9,182,413.16	3,070,137.34
1900..........	61,270	13,453,887.96	4,379,758.10
1901..........	68,648	15,562,796.30	4,972,160.79
1902..........	98,829	19,488,535.30	6,261,927.18
Total.......	319,503	66,141,529.64	$21,251,744.98

In other words, of the lands outside Alaska, an amount equal to over ⅛ was taken up in five years, and 1-27 in a single year. In 1902 there were also given in grants to railroad roads and wagon roads 5,008,131.66 acres. It is evident that in a very few years the last acre of cultivatable land will have been disposed of. This process is accelerated by bogus claims used by ranchmen to fence in great quantities of land for grazing purposes, which it is almost impossible for the government fully to suppress. Of the sales, the chief amounts were in Montana, South Dakota, Idaho, Utah, Nevada, and Minnesota, in order of amounts — of course in Utah and Nevada largely for mineral lands.

Land's End, England, a headland in Cornwall, about 60 feet in height, consisting of granite cliffs, and forming the western extremity of England. There is a lighthouse on the rocks, called Longships, about a mile to the west. Here is the entrance to the English Channel from the Atlantic Ocean.

Landscape Gardening — otherwise, as sometimes called, landscape architecture — is a decorative art that so selects and arranges buildings, roads, paths, lawns, trees, and shrubs as to render beautiful the areas needed around houses and within cities and towns. In this reference the term tree means a woody plant with a single trunk, and the term shrub means woody plant with many trunks. The Roman, and subsequently the Italian, villa was supplemented by a garden into which the architectural and sculptural elements of the villa were freely extended. Terraces with stone foundations and balustrades lead down broad stairways to flower gardens disposed in geometric pattern and frequently accompanied by fountains with stone curb and ornate centrepiece. Casino, grotto, pergola, arch, vase, and even statues increased this formal character; and in consistency therewith the trees, shrubs and hedges were pruned or clipped, and sometimes trimmed into geometric shapes, thus making the so-called topiary work. This formal or architectural style was followed, along with other elements of Italian culture, by the French, until in the 17th century Lenôtre gave it a broader treatment more suited to a level country and peaceful conditions. This formal style prevailed also in England until in the same century a naturalistic style arose which has ever since formed the counterpart and rival to the formal style. It discards the statue, reduces architecture to indispensable bridge and shelter, conceals roads and paths, displaces the terrace by the lawn, and the exotic pattern bedding or the flower bed by the flower border. The herbaceous perennials proper to this style are not eclipsed in beauty or fragrance by their exotic rivals; and, with shrubs and trees, they are freed from the shears to attain their full growth. Shrubs and climbers bind house to earth, and furnish boundaries to the grounds, while flowers range in front of them, or are relegated to a separate section. This naturalistic style has spread throughout northern Europe and the United States, being here the favorite with the late F. L. Olmsted (q.v.) in broad, restful effects produced in many city parks of the land.

The city home-grounds must choose one of these styles to exclusion of the other, and at present the natural style generally prevails; but the city or private park, and even the ample country home-grounds, can combine the two by assigning each its distinctive place, namely, the formal style near the residence — provided that be of dignified architectural style — or the city entrance to the park, and the naturalistic style beyond this and next to the fields or the woods. Thus, the Dresden Park, originally small and formal, has been enlarged by naturalistic grounds; while Central Park, New York, planned on the naturalistic scheme, yet includes the Mall ending in a terrace. Indeed, this composite style, as Edouard André names it, may furthermore include, according to favorable conditions, varieties such as a water garden, a bog or marsh garden, a rock garden, a wild garden, and a sub-tropical garden, each with its characteristic shrubs and herbs. The picturesque style, which F. A. Waugh proposes as a third leading style, approximates this wild variety; though, of course, like other varieties, it may easily expand into a whole park, as must happen in a mountainous district. The Japanese gardening also belongs to this variety, which has irregularity as its chief trait. The aviary and animal collection need never occupy more than one section of one of the parks in a metropolitan park system; but free singing birds and playful animals, such as the squirrel, should enliven every park, great or small, and will do so as soon as our predatory habits have yielded to the mild influences of art.

The principles of landscape gardening, like those of other decorative arts, include in the first place conformity to structure; then, unity of style; next, a variety in unity of the art elements known as mass, proportion, balance, surface, line, color, tonality, chiaroscuro, and texture; and, finally, finish and significance. The application of these principles obviously allows ample scope for originality of treatment. Structural conformity includes relation of house to grounds and of these to locality. A complete plan should be prepared for the park, and even for home-grounds, just as it usually is for a house; and no subsequent fancies should be allowed to disturb the integrity of this scheme for the whole. For home-grounds there are ordinarily needed three distinct sections. The first of these is the lawn between the front of the house and the street. If a front fence is maintained, a border of shrubs should accompany it to give seclusion. Otherwise this border should run along the base of each house and from each house to the next, in order to seclude persons on the veranda or back lawn from the gaze of strangers. The second section is the area at the side and back of the house, which should be enclosed, by hedges or by belts or groups of shrubs, from the other sections and from adjoining properties. This second area should adjoin the living-rooms of the house, and may be simple turf with a flower border along the boundaries — in accord with the naturalistic style, or be divided into terrace, game courts, flower garden, and the like — in accord with the formal style. The third section embraces the kitchen-yard, laundry-yard, and stable, provided with an independent entrance, and screened by lattice with climbers or by shrubs from the street, as well as from other sections. The park structure must regard entrances, roads, paths, game courts, boat-houses, refectory, greenhouse, and the locations suitable for varieties in the composite style.

Unity of style is violated oftenest by introduction of statues or pattern bedding into grounds of the naturalistic style. In the composite style, the pattern bedding, flower garden, or rock garden should be detached from sharp contrast with other elements by hedge, shrubs, or sunken panel. Such unity does not exclude native or acclimated perennials and annuals from use in the home-grounds in front of the hedges or the boundary shrubs, which is, indeed, their ideal place, furnishing a shadowed foil, enlivened by the colors of the flowers.

The prime requisite of variety is that of mass in the grouping of trees or shrubs apart from the lawn or the flower beds. The mere "lover of flowers," untrained in landscape gardening, usually violates this principle by scattering shrubs or trees promiscuously over the grounds at his disposal. Even shrubs or herbs of one kind will be massed with advantage wherever space allows more than one specimen. Such grouping, especially at gateways and prominent curves of roads, will furnish varied views and unexpected beauties; while in other places it will entirely screen ugly objects, or reveal beautiful ones in varying degree. But single shrubs are admissible near the house, walk, or boundary, provided they are specimens of some choice plant.

The variety of proportion in its narrower sense of unequal, vertical divisions, as of a façade or a face, results from placing herbs, shrubs, and trees in this order receding from the house or the centre of the area. This order also gives a curving transition from horizontal ground to vertical tree; and, of course, it also affords each object the best display possible without seriously obstructing another. The whole plantation should be so planned as when mature to be in proportion to the extent of the grounds. In application to gardening, symmetry reduces to balance, that is, an equivalence instead of an equality of parts about a medial line. Variety in surface is secured by sloping, raising, or hollowing the lawn as a whole, and by raised beds or sunken panels for the formal garden. For small areas the concave lawn is best, because giving an effect of greater extent than is really the case. Variety in line must be sought equally in sky line, border line, bed line, and road line. The naturalistic style achieves this end by ovate curves, otherwise variously known as catenary, infinite, swelling, or sweeping curves. The curves of a road should be justified by a plantation, pool, or other impassable object, and the curves of a border by a larger shrub or a group of herbaceous plants. Bays in a tree border lead into vistas which suggest distance and extent of grounds. The formal style achieves variety in line by geometric curves and angles. Variety in color should be sought, not only in flowering herbs and shrubs, but in trees by introduction of those with yellow or red foliage. But the effects chiefly prized are quiet, restful ones, whereas violent contrasts, especially with geranium and coleus against a mowed lawn in pattern bedding, are generally decried. Brilliant masses in the formal style should be carefully harmonized, or be separated by low shrub hedges, bunches of ornamental grass, white flowers, or gravel walks. Tonality is likely to be violated by dark evergreens placed near light green deciduous trees. The degree to which the beauty of a landscape depends on chiaroscuro is fully revealed only by the photograph, which omits the colors that always accompany light and shade in nature. The same grouping that gives mass secures chiaroscuro also. Texture in a plant depends upon the number, shape, disposition, and tissue of its leaves, and varies widely from one plant to another. It therefore supplies an element of variety distinct from the size, shape, or color of the plant, be it herb, shrub, or tree. It is obvious that all the above mentioned qualities must be supplemented by a careful finish, which calls for constant care.

Finally, landscape gardening, like all other arts, has significance besides form. It reveals nature's patience, kindness, and serenity; and thus proves to be the great restorative to men jaded with life's cares. Again, the simple and healthful pleasures of outdoor life moderate the ever increasing demand for the expensive and wasting luxuries of our modern society. Moreover, the landscape designer can convey the simplicity, boldness, or dignity of his own creative mind to the impressionable observer by means of landscape gardening.

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Edmund Buckley,
Editor ‹University Lessons in Art.›

Land'seer, Sir **Edwin Henry,** English painter: b. London 7 March 1802; d. 1 Oct. 1873. Hampstead Heath was the scene of some of his early studies, and on one of his early productions now at Kensington his father has written «at the age of five.» Following the advice of Haydon he studied the Elgin Marbles, the wild beasts, in the Tower and Exeter Exchange, and dissected every animal whose carcass was obtainable. His life is merely the record of his works. In the Academy's exhibition for 1815 he exhibited the ‹Portrait of a Mule,› and the ‹Heads of a Pointer-Bitch and Puppy.› In 1818 he contributed several studies of animals to the Academy and the British Institution. In that year a picture exhibited at the exhibition of the Oil and Water Color Society in Spring Gardens, ‹Fighting Dogs Getting Wind,› secured great applause. In 1820 he painted his ‹Dogs of St. Gothard.› In 1821 he exhibited ‹Ratcatchers,› a ‹Prowling Lion,› and other works of great spirit. In 1822 he received the premium of £150 from the British Institution for the ‹Larder Invaded.› The ‹Cat's Paw› appeared at the Academy in 1824, and was sold for £100. In 1826 he was elected A.R.A., and in 1830 became R.A. In 1827 he exhibited ‹The Return from Deer-Stalking›; a ‹Fire-side Party,› 1829; ‹High Life,› and ‹Low Life,› 1831; ‹Spaniels of King Charles' Breed,› ‹A Jack in Office,› 1833; ‹Bolton Abbey in the Olden Time,› 1834; ‹The Drover's Departure,› 1837; ‹The Return from Hawking,› and the ‹Shepherd's Chief Mourner,› 1837; a ‹Distinguished Member of the Humane Society,› and ‹There's Life in the Old Dog Yet,› 1838; in 1840, ‹Laying Down the Law›; in 1844, ‹Coming Events Cast Their Shadows Before,› and in 1846, ‹The Stag at Bay›; in 1849, ‹The Forester's Family›; in 1850, ‹A Dialogue at Waterloo›; in 1851, ‹A Scene from the Midsummer Night's Dream›; in 1853, ‹Night and Morning,› and ‹The Children of the Mist.› His later works include, ‹Saved,› ‹Deer-Stalking,› ‹A Flood in the Highlands,› ‹Wild Cattle at Chillingham,› his celebrated work of sculpture, the Lions in Trafalgar Square, and others. Landseer's pencil was productive, and besides many works not here named he produced portraits of horses, dogs, and other animals. In 1850 he was knighted; in 1855 he received the gold medal of the Paris exhibition. He declined the presidency of the Royal Academy offered him on the death of Sir Charles Eastlake (1865).

Land'slide, or **Landslip,** the slipping or sliding of land, through the failure of supporting strata, from its original position. They are due to a variety of causes. Water, particularly in its changing forms through frost and thaw, is the chief agent in their production. The wearing away of supports by water, the cracking of underlying materials by summer droughts, and the rending of existing crevices by the thawing of water frozen in them, are some of the commonest modes by which they are brought about. Sometimes a mass of land resting on an inclined bed slides for a considerable distance before it is arrested by a level surface; thus, in 1772, the Solway Moss, loosened by excessive rains, rolled over 400 acres of cultivated land, reaching in some parts to the roofs of the houses. The fall of the Rossberg in Switzerland, and the slip at Charmouth, near Lyme Regis, are other familiar instances. In 1902, in British Columbia a remarkable landslide occurred destroying an entire mountain village and causing the death of nearly 100 persons.

Landsturm, länt'stoorm, in Germany, a local militia, consisting of those of the reserve who are too old to serve in the Landwehr (q.v.). The landsturm is never called on to serve out of its own district except in case of invasion.

Landwehr, länt'vär («national defense»), in Prussia, a term applied to that part of the military force of the state which is not kept constantly under arms, but during peace follows ordinary trades, and is only summoned into active service on the breaking out of war or some internal emergency. In 1805 Austria organized a landwehr; a Russian landwehr was employed in 1812; and in 1871, the system was extended to the whole German empire.

Lane, Anna Eichberg King, American author: b. Geneva, Switzerland, 1856. She is daughter of the late Julius Eichberg (q.v.), a distinguished Boston musician, and received her early education in that city. Her first husband was Tyler Batcheller King, of Boston; in 1898 she was married to John Lane, the publisher, of London and New York. She has written many short stories and poems, among the latter being her national hymn, 'To Thee, O Country!' Her prose writings include: 'Brown's Retreat,' 'Kitwyk,' and 'American Wives and English Housekeeping.'

Lane, Edward William, English Orientalist: b. Hereford 17 Sept. 1801; d. Worthing, Sussex, 10 Aug. 1876. He published 'Manners and Customs of the Modern Egyptians' (1836), and made one of the most famous translations of the 'Arabian Nights' (1838-40). This work was the first translation of consequence into English which was made directly from the Arabic, all previous translations having been made through the French. It contained valuable illustrations and numerous scholarly and indispensable notes. The translations of Burton and Payne were subsequent to it. The world is indebted to him for many valuable works on Egypt, and especially for his 'Arabic-English Lexicon' (1863-74), which cost him 20 years of unremitting labor. The succeeding parts came out from 1877 to 1882 under the editorship of S. Lane-Poole, the whole forming a dictionary indispensable to the student of Arabic. See ARABIAN NIGHTS.

Lane, George Martin, American educator: b. Charlestown, Mass., 24 Dec. 1823; d. Cambridge, Mass., 30 June 1897. He was graduated from Harvard in 1846 and after four years at the universities of Berlin and Göttingen returned to America and became professor of Latin at Harvard in 1851. He held this chair until 1894 when he became professor emeritus. He published 'Latin Pronunciation' in 1871, in which he contended for the continental pronunciation of the language as against the 'English method.' He left unfinished a Latin Grammar, completed by Morgan (1898). The famous ballad of 'The Lone Fishball' was written by Professor Lane.

Lane, Henry Smith, American politician: b. in Montgomery County, Ky., 24 Feb. 1811; d. 1881. He studied law, and was admitted to the bar; removed to Indiana in 1832, and while engaged in his profession became prominent in Whig politics. After serving as State senator (1837), he was twice elected to Congress (1838 and 1840), and in the Mexican War lieutenant-colonel of an Indiana regiment. The dissolution of the Whig party was followed by a preliminary organization which led to the formation of the Republican party, and in this movement Lane was conspicuous, acting with other leaders who planned the first Republican national convention, held in Philadelphia in 1856, and of which he was permanent chairman. A coalition of Republicans with members of the disappearing American party in 1859 elected him to the United States Senate, but after a contest he was unseated in favor of his Democratic competitor. He was elected governor of Indiana in 1860, and in the same year became United States senator, serving one term.

Lane, James Henry, American politician and soldier: b. Lawrenceburg, Ind., 22 June 1814; d. Leavenworth, Kan., 11 July 1866. He was admitted to the bar in 1840, enlisted as private in an Indiana regiment in 1846, served in the Mexican War, became colonel, and at Buena Vista commanded a brigade. Returning from the war, he was elected lieutenant-governor of Indiana; from 1853 to 1855 was a Democratic representative in Congress; in the latter year removed to Kansas, joined the Free-State party, acted as president of the Topeka and Leavenworth constitutional conventions, and became major-general of the Free-State forces. In 1856 the Free-State legislature elected him to the United States Senate, but he was not allowed to sit. He was a prominent actor in turbulent scenes, and was twice indicted, once for treason and again for murder: on the second charge he was tried and acquitted. In 1861 Kansas was admitted to the Union, and Lane was elected United States senator, but entered the Federal army and in the same year was appointed brigadier-general of volunteers, serving with ability until March 1862, when his commission was canceled. The «Great Southern Expedition» from Kansas (1861-2) and other military schemes of the period were conceived by Lane, but came to nothing. As commander for recruiting in the Department of Kansas (1862) he came into collision with the State authorities and was charged with attempted usurpation. In 1865 he was again elected to the United States Senate, suffered from paralysis in the following year, and died by his own hand.

Lane, Joseph, American soldier and politician: b. Buncombe County, N. C., 14 Dec. 1801; d. Oregon 19 April 1881. In 1816 he went from Henderson County, Ky., to Warwick County, Ind., where he was for some time clerk in a mercantile establishment, and in 1822-46 served in both houses of the State legislature. He resigned from the senate in 1846 to enlist as a private in the 2d Indiana volunteers, was soon commissioned colonel of the regiment, and in the same year was promoted brigadier-general. He was wounded at Buena Vista, defeated Santa Anna at Huamantla, and was brevetted major-general, U. S. A., for this service. After the Mexican War he was appointed governor of Oregon territory, was Democratic delegate from Oregon to Congress in 1851-7, defeated the Rogue Indians at Table Rock in 1853, and in 1859-61 was a United States senator. He was nominated for the vice-presidency in 1860 on the unsuccessful Breckenridge ticket.

Lane, Sir Ralph, English administrator in America: b. Northamptonshire, England, about 1530; d. in Ireland 1604. In 1583-4 he held a command in Ireland, in 1585 took the direction of the colony that Raleigh was establishing in Virginia, sailed in that year in the fleet commanded by Sir Richard Grenville, and was left with 107 colonists at Roanoke Island, while the fleet returned to England (25 August). He was thus the first governor of Virginia. The location proved unsuitable, provisions ran low, and there was trouble with hostile Indians. On 19 June 1586 the colony sailed for England in the fleet of Sir Francis Drake. In 1589 Lane was a colonel in Drake's expedition against Portugal, and in 1591 helped to quell a rebellion in Ireland. Letters by him may be read in Hawks' ‘History of North Carolina’ (1857); and in Hale (editor), ‘Archæologia Americana,’ Vol. IV. (1860).

Lane, William Coolidge, American librarian: b. Newton, Mass., 29 July 1859. He was graduated at Harvard in 1881, and was assistant librarian there from 1887 to 1893, when he became librarian of the Boston Athenæum, continuing in that position until 1898, since when he has been the librarian of Harvard University. From 1886 to 1900 he served as secretary and treasurer of the publishing board of the American Library Association, and in 1898–9 was president of the association.

Lane-Poole, Stanley, English archæologist: b. London 18 Dec. 1854. He is a nephew of E. W. Lane, the Orientalist (q.v.). He was educated at Corpus Christi, Oxford; in 1874–92 was employed in the coin department of the British Museum; was sent by the British government on archæological missions to Egypt (1883) and Russia (1886); was employed by the Egyptian government in archæological research at Cairo (1895–7); and in 1898 became professor of Arabic in Trinity College, Dublin. Among his works are: ‘Social Life in Egypt’ (1883); ‘The Moors in Spain’ (1887); ‘Saracenic Egypt’ (1900); ‘Mediæval India’ (1902); and ‘The Story of Cairo’ (1902). He also edited many volumes, and prepared the extensive catalogue of the Oriental and Indian coins in the British Museum (1875–92).

Lane Theological Seminary, a divinity school founded at Cincinnati, Ohio, 1829. It was opened for students three years after its foundation, and its endowment in 1902 amounted to $480,929; its income $18,078; it had five instructors and 20 students. Although it is under the control of the Presbyterian Church it receives students from other reformed bodies. No tuition fees are charged, board is low, and there are 39 scholarships, each of the value of $2,000. The college stands on a lot of sixty acres; there are five professors' houses, and a library containing 19,000 volumes.

Lanessan, Jean Antoine de, zhŏṅ ăṅ-twăn dė lăn-ĕ-săṅ, French naturalist and publicist: b. Saint-André-de-Cubzac, Gironde, 13 July 1843. He entered the health corps of the French marine service, after studying medicine at Bordeaux, and was engaged as surgeon on the coast of Africa and China until the Franco-Prussian war. He was elected to the National Assembly in 1881, and came into notice as a republican journalist. Being interested in colonial matters he was appointed governor-general of Indo-China in 1891; and his writings have done much to promote French colonization. His principal works are: ‘De Protoplasme végétal’ (1876); ‘La Matière, la Vie et les Etres Vivants’ (1879); ‘L'Expansion Coloniale de la France’ (1888); ‘Principes de Colonisation’ (1897).

Lanfranc, lăn'frănk (Fr. lăṅ-frăṅ), Anglo-Norman ecclesiastic, the first archbishop of Canterbury after the Norman Conquest: b. Pavia, Italy, about 1005; d. Canterbury, Kent, 24 May 1089. After studying law in his native city he left Italy about 1039, and founded a school of law at Avranches, which soon became one of the most popular in Europe, but entered the Benedictine monastery of Bec, and in 1046 was chosen its prior. About 1053 he came into close relations with William of Normandy, and though he at first condemned William's marriage with his cousin, he afterward (1059) went to Rome to procure the papal dispensation for it. William accordingly made him prior of his new foundation, the abbey of St. Stephen at Caen (1062), and in 1070 made him archbishop of Canterbury in place of Stigand. Lanfranc was William's most valued counsellor and continued in the reign of William Rufus to exercise great influence in the government of England. See Freeman, ‘History of the Norman Conquest.’

Lanfrey, Pierre, pē-ăr lăṅ-frā, French historian and publicist: b. Chambéry 26 Oct. 1828; d. Pau, France, 15 Nov. 1877. He was educated in the Jesuit college of his native town and in Paris, and became well known by the publication of works in support of political and religious liberalism. These include: ‘L'Eglise et les Philosophes au XVIII. Siècle’ (1855); ‘Essai sur la Révolution Française’ (1858); ‘Histoire Politique des Papes’ (1860); ‘Lettres d'Everard’ (1860), a social novel in epistolary form; ‘Le Rétablissement de la Pologne’; and ‘Etudes et Portraits Politiques’ (1863). His most important work is a ‘History of Napoleon I.’ (1867–75), which is strongly hostile to Napoleon. It was left incomplete at his death. In 1871 he was elected to the National Assembly by the department of Bouches-du-Rhone, and took his seat with the republican left. He was ambassador at Berne 1871–3, and in 1875 he was elected a life senator.

Lang, Andrew, Scottish author: b. Selkirk 31 March 1844. He was educated at St. Andrews and at Balliol College, Oxford; was elected fellow of Merton, Oxford, in 1868; in 1888 was appointed Gifford lecturer on natural religion at St. Andrews; became a constant contributor to periodical literature; and published an extensive list of volumes on a wide variety of subjects, being recognized as the most versatile of present-day writers. His wide learning appears in his prose renderings of the ‘Odyssey’ (1879; with Butcher), and the ‘Iliad’ (1882; with Myers and Leaf), and ‘Homer and the Epic’ (1893), a defense of the unity of the poems; in his works on comparative mythology and religion, ‘Custom and Myth’ (1884), ‘Myth, Ritual, and Religion’ (1887; new ed. 1899); ‘The Making of Religion’ (1898), and ‘Magic and Religion’ (1901); and in his studies of Scottish history, such as ‘A History of Scotland from the Roman Occupation (1900 et seq.). Some of the most interesting of his work is to be found in ‘Letters to Dead Authors’ (1886); ‘Letters on Literature’ (1889); ‘Angling Sketches’ (1891); ‘Essays in Little’ (1891); ‘Adventures Among Books’ (1904). He published also collections of *vers de société,* ‘Ballades in Blue China’ (1880), and ‘Rhymes à la Mode’ (1884); and in verse, ‘Ban et Arrière Ban’ (1894), and his most ambitious poem, ‘Helen of Troy’ (1882). Mention should also be made of ‘Cock-Lane and Common Sense’ (1894), a discussion of the spiritualistic question; and the biographies of Lockhart (1896) and Tennyson (1901).

Lang, Benjamin Johnson, American musician: b. Salem, Mass., 28 Dec. 1837. He studied music under his father, an organist and pianoforte teacher, and at 15 began work as teacher and organist. In 1855 he went to Germany for further study, which for three years he pursued under the instruction of Liszt, Albert Jaell, and others. Returning to Boston, he at once attained prominence as organist, pianist, teacher, and conductor; became organist of the Handel and Haydn Society in 1859, and conductor of the same in 1895; conductor of the Apollo Club in 1868; and of the Cecilia Society in 1874. In 1869 he made a second visit to Europe, and gave concerts in Berlin and other cities. As a member of the concert committee of the Harvard Musical Association he has done much in the interest of musical culture, and through this and other organizations has secured the production of many new works. The introduction of Wagner to the American public was in no small part due to his presentation of that master. While he has accomplished much work as a composer, few of his compositions have been published.

Lang, John Marshall, Scottish Presbyterian clergyman and author: b. Glasford, Lanarkshire, 4 May 1834. After completing his education at Glasgow University he took charge of several churches in succession, but returned to Glasgow in 1873, and was appointed to the Barony Church, where he had previously been installed in 1865, but left it for Edinburgh in 1868. In 1900 he was elected vice-chancellor and principal of Aberdeen University. He is the author of ‘Gnostic Sects and Heresies’ (1873); ‘Heaven and Home’ (1875); ‘The Last Supper of Our Lord’ (1881); ‘Life: Is it Worth Living?’ (1883); ‘Ancient Religions of Central America’ (1882); ‘The Church and the People’ (1893).

Lang, Margaret Ruthven, American composer: b. Boston 27 Nov. 1867. She studied the pianoforte under her father, B. J. Lang (q.v.); the violin under Louis Schmidt in Boston, and (1886–7) with Drechsler and Abel in Munich; composition with Victor Gluth in Munich; and orchestration (1887) under G. W. Chadwick, Boston. Her piano solos, songs, etc., have been received with high appreciation in musical circles; her ‘Dramatic Overture’ has been performed by the Boston Symphony Orchestra, and the Chicago Orchestra has several times given ‘Witichis,’ Theodore Thomas conducting.

Lang, Wilhelm, vil'hělm läng, German journalist and essayist: b. Tuttlingen 16 July 1832. Among his works are: ‘Michelangelo Buonarotti as a Poet’ (1861); ‘David Friedrich Strauss’ (1874); ‘Wanderings in Peloponnesus’ (1878); ‘From Suabia: History, Biography, Literature’ (in 7 parts, 1885–90), a collection of delightful essays; ‘The German Party in Würtemberg 1866–91’ (1892).

Lang'bridge, Frederick, English clergyman and author: b. Birmingham 17 March 1849. He was graduated at Oxford University and adopted the profession of private tutor and schoolmaster. He is now rector of St. John's, Limerick. He has published ‘Gaslight and Stars’ (1892); ‘A Cracked Fiddle’ (1892); ‘Ballads for the Brave’ (1890); ‘Love Has no Pity’ (1901); etc.; and many books for young people.

Lang'dell, Christopher Columbus, American lawyer: b. New Boston, Hillsborough County, N. H., 22 May 1826. He studied at Harvard, was graduated from its law school in 1853, in 1853–70 practised in New York, in 1870 became professor of jurisprudence in the Harvard law school, and in 1871 dean of the law school faculty. In 1895 he retired. He was an originator of the so-called «case» system of legal study, and was otherwise prominently identified with the progress of professional education in this country. His publications include: ‘Selection of Cases on the Law of Contracts’ (1870; enlarged ed. 1877); ‘Cases on Sales’ (1872); ‘Summary of Equity Pleading’ (1877; 2d ed. 1883); and ‘Cases in Equity Pleading’ (1878).

Lang'don, John, American statesman: b. Portsmouth, N. H., 25 June 1741; d. there 18 Sept. 1819. At the outbreak of the Revolutionary War he embarked in the patriotic cause, and in 1775 he was a delegate to the Continental Congress, but resigned office in June 1776, on becoming navy agent. In 1777, while speaker of the New Hampshire assembly, he pledged a large portion of his property for the purpose of equipping the brigade with which Stark defeated the Hessians at Bennington. Subsequently he was a member and Speaker of the State legislature, a member of the Continental Congress, a delegate to the convention which framed the Constitution of the United States, and president of New Hampshire. He was one of the first United States senators from New Hampshire, which office he held until 1801. In politics he acted with Jefferson, who upon assuming office in 1801 offered him the post of secretary of the navy, which he declined. From 1805 to 1812, with the exception of two years, he was governor of New Hampshire; and in 1812 he was offered by the Republican congressional caucus the nomination for the office of vice-president of the United States, which, on the score of age and infirmities, he declined. The remainder of his life was passed in retirement.

Langdon, Samuel, Congregational clergyman and educator: b. Boston, Mass., 1723; d. Hampton Falls, N. H., 1797. He was graduated from Harvard in 1740 and was pastor at Portsmouth, N. H., 1747–74. In 1774 he became president of Harvard, resigning in 1780. In the New Hampshire Convention he ardently advocated the ratification of the Federal Constitution.

Lange, läng'ė, **Julius Henrik,** Danish art critic: b. Vordingborg 19 June 1838. After leaving the University of Copenhagen he traveled in Italy, and thereafter devoted himself to study of the history of art. Among his works are: ‘On Art Values’ (1876); ‘Danish and Foreign Art’ (1879); ‘Gods and Men in Homer’ (1881); ‘Art and Politics’ (1885); ‘Bastien Lepage and Other Painters’ (1889); ‘Thorwaldsen's Representation of the Human Figure’ (1893).

Langevin, länzh-văn, Sir **Hector Louis,** Canadian statesman: b. Quebec 26 Aug. 1826. He was called to the bar in 1850, was editor of the ‘Mélanges Religieux’ in 1847, and of the ‘Courrier du Canada’ ten years later, and was appointed Queen's Counsel in 1864. Entering the Canada Assembly he became a member of the executive council, and at the union of the provinces in 1867 was made secretary of state for Canada, was subsequently minister of public works (1869–73); postmaster-general (1878); and minister of public works (1879). He retired from public life in 1891.

Langevin, Jean François Pierre La Force, zhŏṅ fräṅ-swä pē-ār lä fôrs, French-Canadian Roman Catholic bishop: b. Quebec 22 Sept. 1821; d. 26 Jan. 1892. He was educated at the Quebec Seminary, was ordained priest in 1844, and consecrated bishop of Ramonski in 1867. In 1870 he founded the College of Ramonski, and in 1886 was appointed assistant to the apostolic throne. Among his publications were: 'Histoire du Canada en Tableaux' (1860); 'Cours de Pédagogie' (1865).

Langevin, Louis Philip Adelard, Canadian Roman Catholic prelate: b. St. Isidore, La Prairie County, Quebec Province, 23 Aug. 1855. He was educated at Montreal College; studied theology at the Sulpician Grand Seminary and St. Mary's College, Montreal; was ordained priest in 1882; was appointed professor of moral theology in the Catholic University of Ottawa; and in 1893 became rector of St. Mary's Church of Winnipeg. In 1895 he took office as archbishop of St. Boniface, Manitoba. He founded many parishes, and educational and missionary institutions.

Lang'ford, John Alfred, English journalist and lecturer: b. Birmingham 12 Sept. 1823. He has worked on the editorial staff of the Birmingham *Daily Press, Daily Gazette* and *Morning News*. He was teacher of English literature in the Birmingham and Midland Institute (1868–74). His publications include poems, essays, local histories, the chief of which are 'Prison Books, and Their Authors' (1861); 'The Praise of Books' (1880); 'A Century of Birmingham Life' (1868); 'Staffordshire and Warwickshire, Past and Present' (1874); 'A Life for Love, and Other Poems' (1900); etc.

Lang'horne, John, English poet and translator of Plutarch: b. Kirkby Stephen, Westmoreland, March 1735; d. Blagdon 1 April 1779. Having taken orders, he became a curate in Essex in 1761, and rector of Blagdon, Somerset, in 1766. In 1777 he was installed a prebendary of Wells Cathedral. He wrote verses and stories once popular, but he is remembered now only by the translation of Plutarch's Lives which he made with his brother William (1721–72). This work, originally published in 1770, has passed through many editions.

Langlande, lăng'lănd, **Langelande,** or **Longland, William,** English poet: b. Cleobury Mortimer, about 1332; d. about 1400. Little is known of him except from tradition, according to which he was educated at Oxford, and became a monk of Malvern. The familiarity of the author with the Scriptures and the church fathers indicates that he was an ecclesiastic; several local allusions in the poem, and the fact that its scene is the "Malverne Hilles," prove that it was composed on the borders of Wales; and internal evidence fixes its date at about 1362. It narrates the dreams of Piers Ploughman, who, weary of the world, falls asleep beside a stream in a vale among the Malvern hills; and while satirizing in vigorous allegorical descriptions the corruptions in church and state, and the vices incident to the various professions of life, and painting the obstacles which resist the amelioration of mankind, presents the simple plowman as the embodiment of virtue and truth, and the representative of the Saviour. Its ancient popularity appears from the large number of MS. copies still extant, most of them belonging to the latter part of the 14th century. It was a favorite of religious and political reformers, and several imitations of it appeared, the most important of which was 'Piers Ploughman's Crede,' written about 1393 by some Wycliffite, assailing the clergy, and especially the monks. In 1550 the 'Vision of Piers Ploughman' was printed by the reformers, and so favorably received that three editions were sold within a year. This poem is a remarkable example of a system of verse, derived from the Anglo-Saxons, and marked by a regular alliteration instead of rhyme. There are two classes of manuscripts, which give the text with considerable variations. The best edition both of the 'Vision' and the 'Crede' is that of Wright (1856, new ed. 1897); and of the 'Vision,' that of Skeat (1886). Consult Jusserand, 'Piers Plowman: a Contribution to the History of English Mysticism' (1893), and 'Literary History of the English People' (1894).

Langley, lăng'lĭ, **Samuel Pierpont,** American astronomer and physicist: b. Roxbury, Boston, 22 Aug. 1834. He entered the practice of architecture and civil engineering, became an assistant in the Harvard Observatory in 1865, and later assistant professor of mathematics in the United States Naval Academy, and in 1867 was appointed director of Allegheny Observatory. In 1887 he became secretary of the Smithsonian Institution. He organized in 1881 an expedition to Mount Whitney, Cal., where he was successful in re-establishing the color constant and in extending the invisible solar spectrum. He also devised the bolometer, or thermic balance, a contrivance for detecting minute differences of radiant heat and measuring accurately to less than one ten thousandth of a degree Fahrenheit. His name became generally known through his ineffective experiments in connection with the problem of mechanical flight. A sum of $5,000 was voted him by Congress for the carrying out of his ideas. The general plan of his airship as tested consisted in the use of the aëroplane as a means of support; but neither this support nor the propulsive power was found adequate. Among his writings are: 'The New Astronomy'; 'Experiments in Aëro-Dynamics'; and 'Internal Work of the Wind.'

Langley, Walter, English painter: Birmingham, England, 1852. After attending the National School, Birmingham, he qualified himself as a lithographer, meanwhile studying in the local school of art. He there gained the National scholarship and studied at South Kensington two years; settled in Newlyn, Cornwall, 1882. He had been awarded a gold medal for painting both at Paris and Chicago. Among his watercolor paintings are: 'Among the Missing'; 'Departure of the Fleet'; 'Disaster'; 'After the Storm.' His oil paintings include: 'Never Morning Wore to Evening but Some Heart Did Break'; 'Motherless'; 'Bread-winners'; etc.

SAMUEL PIERPONT LANGLEY,

SECRETARY OF THE SMITHSONIAN INSTITUTION.

Langobardi, lăn-gō-bär'dī. See Lombards.

Lang'shan, a breed of small, active «Asiatic» fowls, long held in esteem by poultry-raisers; cocks weigh 10 pounds. Two varieties are approved — the pure white and the glossy black. See Poultry.

Langs'ton, John Mercer, American educator: b. in Louisa County, Va., 14 Dec. 1829; d. Washington, D. C., 15 Nov. 1897. He was born a slave, but when six years old was emancipated, and in 1849 was graduated at Oberlin College, where he was also (1853) a graduate in theology. Admitted to the bar in Ohio (1854), he practised law in that State for 13 years, and in 1869 was appointed professor of law at Howard University, Washington, D. C.; became dean of the law department, and in 1873 vice-president of the university. In 1871 he was appointed a member of the board of health of the District of Columbia, and was afterward elected secretary of the District. From 1877 to 1885 he was United States minister and consul-general in Haiti, and when he returned to this country he was made president of the Virginia Normal and Collegiate Institute at Petersburg. He was elected to Congress in 1888. He published ‹Freedom and Citizenship,› a collection of addresses (1883).

Lang'ton, Stephen, English cardinal: b. about 1150; d. Slindon, Sussex, 9 July 1228. He was educated at Paris and while on a visit to Rome in 1206 Innocent III. created him a cardinal and nominated him to the see of Canterbury, consecrating him archbishop next year. King John refused to allow Langton to take possession of his see, and it was not till England had been placed under an interdict, John excommunicated and threatened with deposition, that the king yielded. Langton was acknowledged in 1213, and in August joined the insurgent barons, and acted with them in compelling John to sign Magna Charta. He crowned Henry III., and in 1223 demanded of him the full execution of the charter. He was the author of some theological treatises, and the division of the Bible into chapters has usually been attributed to him. Consult: Hook, ‹Archbishops of Canterbury.›

Lang'try, Lily, English actress: b. Island of Jersey 1852. She was the daughter of the Rev. W. C. Le Breton, Dean of Jersey, and as the «Jersey Lily» (a name given by Millais to the portrait of her which he had painted) was famous for her singular beauty and social graces. In 1881 she made her first appearance on the stage at the Haymarket Theatre in ‹She Stoops to Conquer.› She paid several professional visits to the United States, and in 1903 she starred in a play written by herself in collaboration with J. Hartley Manners.

Language. See Etymology; Philology; Science of Language; Speech; Writing.

Languedoc, lăng'gwē-dŏk (Fr. läṅ-gė-dōk), France, a former province, now forming the departments of Aude, Tarn, Hérault, Lozère, Ardêche, and Gard, as well as the arrondissements of Toulouse and Villefranche, in the department of Haute-Garonne; and the arrondissements of Puy and Yssingeaux, in the department of Haute-Loire.

Langur, lăn-goor', a monkey of the genus *Semnopithecus,* represented by numerous large leaf-eating species from Ceylon and India eastward to China and Borneo. They form a transition group between the gibbons and the catarrhine monkeys, and include a large number of well-known species, with long hind legs and tails and no cheek-pouches, such as the entellus, or sacred monkey of India, the wanderoos of Ceylon, the lutongs of the Malayan islands, and several less known forms.

Lanier, lạ-nēr', **Clifford Anderson,** American author: b. Griffin, Ga., 24 April 1844. He studied at Oglethorpe College, leaving at the end of his sophomore year, desiring to enter the Confederate army, for which, however, he was then too young. In 1862 he volunteered as a Georgia soldier; served in Virginia; was signal officer of a blockade-runner in 1864, and suffered shipwreck. In 1885 he became superintendent of schools at Montgomery, Ala. He has written ‹Thorn Fruit,› a novel; ‹The Mate's Race with the Banshees›; ‹Love and Loyalty at War,› and other stories; ‹Dialect Poems,› with his brother, Sidney Lanier (in Poems of the latter); ‹Apollo and Keats on Browning, and Other Verses› (1902); etc.

Lanier, Sidney, American poet: b. Macon, Ga., 3 Feb. 1842; d. Lynn, N. C., 7 Sept. 1881. His father, Robert Lanier, a lawyer of Macon, came from a family noted for a love of music and art. An ancestor, Jerome Lanier, a Huguenot refugee, was well known at the court of Queen Elizabeth as a musical composer; another forebear, Nicholas Lanier, was director of music at the court of James I. and Charles I., and first marshal of the Society of Musicians incorporated at the Restoration. Sidney Lanier's mother, Mary Anderson, belonged to a prominent Virginia family also noted for decided talent for music and poetry. The poet's artistic temperament was therefore a direct inheritance. As a child Lanier was passionately fond of music and without any instruction learned to play on the guitar, piano, flute, and violin. A critic said of him in later years: «In his hands the flute was transformed into a voice that set heavenly harmonies into vibration.» This passion for music also showed itself in his keen sensitiveness to rhythmic effect. At 14 he entered the sophomore class of Oglethorpe College, Georgia, and after three years graduated with distinction. He was tutor in the college until the outbreak of the Civil War, when he joined the Confederate army as a private soldier. He fought in several important battles, was transferred to the signal service, and finally became signal officer of a blockade runner. In the autumn of 1864 he was captured and confined in Point Look Prison. He had taken advantage of every leisure moment to pursue his studies in literature, modern languages, and music, and during his long idle hours in prison he gained a complete mastery of the technique of the flute. He was released in February 1865, and made his way on foot to Macon, but the fatigue of the journey added to the previous hardships of camp and prison caused a severe illness which did irreparable damage to his lungs. The years that followed were years of hand-to-hand fight for a subsistence. For two years he was clerk in a hotel in Montgomery, and there wrote his novel ‹Tiger Lilies,› a book of power and promise, but hastily written and poorly sustained; he taught at Prattville, Ala., and studied and practised law with his father for five years in Macon. In December 1867 he married Miss Mary Day of Macon, and her belief in his genius, her willingness to endure with him privation and hardship made possible the valiant struggle and the achievement of the next 14 years. In the autumn of 1873, after an unsuccessful attempt to re-establish his health by a winter in Texas, he determined to move to Baltimore, where he could find greater opportunities for culture. He played the flute in the Peabody orchestra; in the intervals of hemorrhage he wrote articles for magazines; he gave lectures on literature in private schools; and thus, with the generous aid of his father, he supplied the necessities of his family. His study of languages, of Anglo-Saxon and early English texts, of English and of foreign literature, was incessant and systematic. In February 1879 he was appointed lecturer on English literature at the Johns Hopkins University, and this position he held until his death. His two principal courses of lectures at the university are embodied in his 'Science of English Verse' (1879), a thorough and suggestive treatise on English metre, declaring that English verse depends on stress, not accent, and that it is based on certain easily recognized musical rhythms, and 'The English Novel' a masterly treatment of the development of the idea of personality and its place in the modern novel. Again and again Lanier was driven by illness to Texas, to Florida, to North Carolina, but he was never idle; he studied much, he thought largely on all vital subjects, on love, life, art, economics, religion, and now and then he gave to the world poems of exquisite truth and beauty. In the spring of 1881 it became evident that the unequal fight was nearing its end, and as a last restort he tried tent life in the mountains of North Carolina. The last illness came at Lynn, in Polk County, and on a morning of early September he passed away.

Lanier's most important prose works besides those already mentioned are: 'The Boy's Froissart' (1878); 'The Boy's King Arthur' (1880); 'The Boy's Mabinogion' (1881); 'The Boy's Percy' (1882); 'Shakespeare and his Forerunners' (1902). His best known poems are: 'Hymns of the Marshes'; 'Clover'; 'The Song of the Chattahoochee'; 'The Crystal'; 'Corn'; 'The Symphony', and 'The Centennial Meditation.' The distinctive characteristics of his poetry are a wholesome outlook upon life, a constant recognition of the highest in character and in thought, and a varied fresh and melodious rhythm. His passion for good and love, his robustness, his high conception of the meaning and power of the love of man and woman, proclaim his close kinship to Browning. In questions of social economics Lanier was abreast of his time; he believed in the rights of the individual, he hated the iron hand of unjust trade, but he realized that these problems must be solved in the "patient modern way." He knew that the great poet must be an artist in sound and color, as well as a thinker, and that no labor was too arduous for perfecting verse forms; to attain perfection in his art the poet must make the mechanical verse fulfil its vast possibilities, he must gain the mastery over imagination, so that imagination may become his servant. But for Lanier there was no art for art's sake; art was consecrated to man and to God. Like all true poets he lived near to nature, and he has described our Southern scenery with loving faithfulness warmed by vivid imagination. He has given new meaning to "our forests of live-oak beautifully braided and woven with intricate shades of the vine; to our broad fronded fern and keen-leaved canes." The luxuriance of the southern forests, the wealth of undergrowth, the warmth, the color, the singing birds live in his poetry, but there is no undue heat, no tropical languor. Whittier has not been more faithful to the rocky coasts, to the snowstorms of New England, than has Lanier to the South. Consult his completed poems with memoir by W. H. Ward (1881-4). EMILIE McVEA,

Sec'y Southern Association of Southern Women.

Lan'igan, George Thomas, American journalist and poet: b. Canada 10 Dec. 1845; d. Philadelphia 5 Feb. 1886. With Robert Graham, he founded in Montreal the 'Free Lance,' a satirical and humorous journal, later published as the 'Evening Star,' and afterward in the United States was connected with the New York *World* and other journals. His writings include: 'Canadian Ballads' (1864); 'Fables Out of the World' (1878), by "George Washington Æsop." He will be longest remembered by his 'Threnody' (for the Ahkoond of Swat), one of the most successful of humorous poems.

Lank'ester, Edwin Ray, English zoologist: b. London 15 May 1847. Educated at Downing College, Cambridge, and Christ Church, Oxford, he was elected a fellow and lecturer of Exeter College, Oxford, in 1872. In 1874-90 he was professor of zoology and comparative anatomy in University College, London, and from 1891 till 1898 Linacre professor of human and comparative anatomy at Oxford. Since 1898 he has been director of the natural history department of the British Museum. Elected a fellow of the Royal Society in 1875, he became its vice-president in 1896, and in 1885 he was awarded one of its royal medals. In 1884 was prominent in founding the Marine Biological Association, now located at Plymouth, and in 1869 became chief editor of the 'Quarterly Journal of Microscopic Science.' Lankester's works include the following: 'A Monograph of the Fossil Fishes of the Old Red Sandstone' (part I., 1870); 'Comparative Longevity in Man and the Lower Animals' (1870), an Oxford prize essay: 'Contributions to the Developmental History of the Mollusca' (1875); 'Studies in Apus, Limulus, and Scorpio' (1881); 'On Food' (1882); and 'The Advancement of Science' (1890), nine essays and addresses.

Lan'man, Charles, American author: b. Monroe, Mich., 14 June 1819; d. Washington, D. C., 4 March 1895. He was educated at the Academy of Norwich, Conn., and went to New York, where he was in business from 1835 to 1845. He then returned to Monroe as editor of the 'Gazette.' He afterward joined the staff of the 'National Intelligencer' at Washington, D. C. He was private secretary of Daniel Webster in 1850, and secretary to the Japanese legation in Washington in 1871-82. He was among the first to explore the mountains in North Carolina. Among his writings are: 'A Tour to the River Saguenay' (1848); 'Private Life of Daniel Webster' (1852); 'Dictionary of Congress' (1858); 'The Japanese in America' (1872); 'Biographical Annals of the Civil Government of the United States’ (1876); ‘Haphazard Personalities’ (1886); etc.

Lanman, Charles Rockwell, American Orientalist: b. Norwich, Conn., 8 July 1850. He was graduated at Yale in 1871; studied Greek and Sanskrit there, and from 1873 to 1876 pursued studies in Orientalism at Berlin, Tübingen, and Leipsic, returning in the latter year to accept a fellowship at Johns Hopkins University. Since 1880 he has been professor of Sanskrit at Harvard. He has lectured at many institutions on Oriental subjects; has traveled in India, and from 1879 to 1884 was secretary of the American Philological Association, edited its ‘Transactions’ (Vols. X.–XIV.), and in 1890 became its president. He was corresponding secretary of the American Oriental Society from 1884 to 1894 and in 1896, and has served it as vice-president since 1897. His published works include: ‘Noun-Inflection in the Veda’ (1880); a ‘Sanskrit Reader, with Vocabulary and Notes’ (1884–8); ‘The Beginnings of Hindu Pantheism’ (1890); ‘Rāja-Çekhara’s Karpūra-mañjarī,’ a translation of a Hindu drama of 900 A.D. (1900); and numerous contributions to Oriental and other journals.

Lanman, Joseph, American naval officer: b. Norwich, Conn., 11 July 1811; d. 13 March 1874. Entering the navy as a midshipman in 1825, he was commissioned lieutenant in 1835, commander in 1855, captain in 1861, and commodore in 1862. In the two attacks on Fort Fisher (1865) he led the line with the Minnesota, winning signal praise from Rear-Admiral D. D. Porter in his official report. He was raised to the rank of rear-admiral in 1867, and after further efficient services, in 1872 he was retired.

Lan'ner, the name of a small «noble» falcon formerly in high repute among European falconers of mediæval times, the identity of which, however, is not quite clear. It was probably the handsome reddish-gray *Falco feldeggi* of the Mediterranean region, still highly valued among Bedouin falconers for its docility and graces. The name is extended to other African and Asiatic hawks of similar appearance and qualities.

Lanoe, Falconer. See Hawker, Mary Elizabeth.

Lan'olin, a fatty substance obtained from the grease of sheep's wool, and consisting chiefly of cholesterin. The wool-grease is saponified by means of caustic soda, and the resulting emulsion is diluted with water. The lanolin then separates in fine particles, which, by the aid of a centrifugal separator, may be obtained in a creamy mass. The lanolin of commerce contains about 30 per cent of water. Lanolin is very generally used as a basis in the preparation of salves and ointments, since it does not grow rancid, and is itself antiseptic to a certain extent. It absorbs water, and penetrates the tissues of the body much more freely than lard or vaseline.

Lans'dell, Henry, English clergyman, traveler, and author: b. Tenterden, Kent, 10 Jan. 1841. As secretary to the Irish Church Mission, he has been prominent in philanthropic movements, traveling extensively about the world. In Siberia he investigated the prisons, publishing the results of his observations in ‘Through Siberia’ (1882); ‘Russian Central Asia’ (1885); ‘Chinese Central Asia’ (1893). Since 1892 he has been chaplain of Morden College, Blackheath, Kent.

Lans'downe, Henry Charles Keith Fitz Maurice, 5th Marquis of, British statesman: b. 14 Jan. 1845. He was educated at Eton and Oxford, and entered in politics as a member of the Liberal party. He was one of the Lords of the Treasury (1869–72); Under-Secretary for War (1872–4); and in 1883 successor of the Marquis of Lorne as Governor-General of Canada. His period of office was marked by the completion of the Canadian Pacific railway, a peaceful arbitration of the fishery dispute with the United States, and the crushing of Riel's rebellion. In 1888 he was made Viceroy and Governor-General of India, in 1895 joined Lord Salisbury's cabinet as secretary for war, and in 1900 was appointed secretary of state for foreign affairs.

Lans'ford, Pa., borough in Carbon County, on the Central railroad of New Jersey, 44 miles north of Reading. It is the centre of the anthracite coal fields. It was settled in 1845, and was incorporated in 1876. The government is administered by a burgess elected every three years and a borough council which controls the local administrative offices. Pop. (1890) 4,000; (1900) 4,800.

Lan'sing, John, American jurist: b. Albany, N. Y., 30 Jan. 1754; d. 12 Dec. 1829. He studied law in Albany and New York; was engaged in practice at the beginning of the Revolution, during a period of which he served as military secretary to Gen. Schuyler. In 1784 he was elected to Congress, and while a member of that body was elected to the lower house of the New York legislature, where he was chosen speaker in 1786, in which year he also became mayor of Albany. For a short time he represented New York in the Constitutional Convention (1787), which he left because he held that he had been sent to participate in an amendment of the Articles of Confederation, and not in the forming of a new constitution. In 1788, at the New York convention, his opposition to the ratification of the Constitution was stoutly maintained. He served on the New York-Vermont boundary commission; in 1790 was appointed a judge of the New York Supreme Court, and became chief justice in 1798. From 1801 to 1814 he was chancellor of the State.

Lansing, Mich., city, capital of the State and county-seat of Ingham County, at the junction of the Grand and Cedar Rivers, and on the Chicago & G. T., the Lake Shore & M. S., and several other railroads, 85 miles northwest of Detroit. It is the farming trade centre for the surrounding region, and is engaged in the manufacture of agricultural implements, flour, stoves, machinery, beet sugar, canned goods, carriages, wagons, trunks, wheelbarrows, artificial stone and knit goods. It contains the State Capitol, built at a cost of $1,500,000; State Hospital; State Library, containing 105,000 volumes; United States government buildings; State School for the Blind; and the State Industrial School; State Agricultural College with a farm of 675 acres; and has electric light and street railroad plants; water power from the river; which is spanned by several bridges; National and State banks; about 20 churches; daily, weekly, and monthly periodicals; and an assessed property valuation of over $6,000,000. Under a charter of 1897, the city is governed by a mayor and council elected every two years. The waterworks and electric light plants are owned and operated by the municipality. The city was settled in 1837, laid out for the State capital in 1847 and incorporated in 1869. Pop. (1890) 13,102; (1900) 16,485.

Lansing Man, a term applied to a collection of human bones, found near Lansing, Kan., 20 feet below the surface of the earth, under a stratum of carboniferous limestone. The skull which was well preserved measured: Maximum length 188 mm.; breadth 138 mm.; cranial index 73.4. From the date of this discovery a few years ago, men of science have been divided in their opinion as to the antiquity of the remains. According to some scientists this skull is one of the oldest ever found in America, having belonged to a human being who lived on this continent prior to the glacial period; and as such, is of the same age, if not older, than that of the Pithecanthropus, found in Java, by Dr. Dubois. The opposition holds to the contrary, pointing to the fact that while of a rather low type of man, the skull differs very little from that of a modern Sioux Indian, and is not at all like that of the Java skull, which belonged to a being midway between the highest type of kula-kamba chimpanzee and the lowest type of negro. In the opinion of Prof. Upham, the Lansing skeleton offers probably the oldest proof of man's presence on this continent; yet it is only a third, probably only an eighth, as old as the flint hatchets of St. Acheul. It has been estimated that man in the Somme Valley and other parts of France, and in southern England, made good palæolithic implements fully a hundred thousand years ago. When the earliest man came to America cannot probably be closely determined. It may have been during the glacial period; it may have been earlier. In Prof. Upham's opinion, the Lansing discovery gives us much definite knowledge of a glacial man, dolichocephalic, low-browed, and prognathous, having nearly the same stature as our people to-day. Prof. Williston believes that the Lansing man was doubtless contemporary with the equus fauna, well represented in the late Pleistocene deposits of Kansas, which include extinct species of the horse, bison, mammoth and mastodon, moose, camels, llamas and peccaries. He was also the contemporary of the late palæolithic men of Europe, whose advanced implements showed that they had developed beyond the stages of primitive savagery.

Lansquenet, lăns'kĕ-nĕt, in Germany, a foot soldier, originally one belonging to the army of the Emperor Maximilian in the 15th century; afterward, a soldier of fortune; a soldier who gave his services to any one who paid highest. The name became corrupted into lance-knight. Also the name of a game at cards now obsolete, and originally played in the 15th century. It is similar to faro.

Lan'tern, or **Lanthorn,** (1) a small metallic frame used for carrying a lamp or candle in, consisting of a case or vessel made of tin. Lanterns were used by the ancients in augury. They were also carried before troops on the march by night, being then borne on the top of pikes, and so constructed as to throw lights only behind them. Dark lanterns are provided with only a single opening, which can be closed up when the light is required to be hidden, or opened when there is occasion for its assistance to discover some object. See LAMP.

(2) In architecture, a small structure on the top of a dome, or in other similar situations, for the purpose of admitting light, promoting ventilation, or for ornament, of which that on the top of the capitol at Washington may be referred to as an example. In Gothic architecture the term is sometimes applied to *louvres* on the roofs of halls, etc., but it usually signifies a tower which has the whole height, or a considerable portion of the interior, open to view from the ground, and is lighted by an upper tier of windows.

Lantern-fish, a general term for the luminous fishes of the depths of the sea, most of which belong to a single group (*Iniomi*). See DEEP SEA EXPLORATION; DEEP SEA LIFE; FISH; ICHTHYOLOGY.

Lantern-flies, homopterous bugs with membranous forewings concealing the folded hinder wings when the insects are at rest, and the head greatly prolonged and said to be light-giving in some tropical species. They feed upon plants and deposit their eggs in slits cut in the bark. The best known species is the candle-fly (*Fulgora laternaria*) of tropical America, but the luminosity alleged of it is an old story not recently verified. Many other popular beliefs are attached to the insect. It is said in Brazil, for instance, to be so poisonous that anything against which it strikes its long beak will fall dead. Several small and non-luminous species of this family occur in the United States. Consult Brunner, ‹Am. Naturalist,› Vol. XXIII., 1885, p. 835.

Lantern of Demosthenes. See LYSICRATES, MONUMENT OF.

Lanterns, Feast of, a religious ceremony held in China on the 15th day of the first month of the year. It derives its name from the vast number of lanterns which are hung out of the houses and in the streets. The lanterns used are often of great value, being richly ornamented with gilding, painting, japanning, and sculpture, and some of them are of great size, reaching nearly 30 feet in diameter, and are so constructed as to resemble halls or chambers.

Lanthanum, a rare metallic element resembling cerium in its general properties, discovered by Mosander, in 1839, in the Swedish mineral cerite. It has the chemical symbol La, and an atomic weight (for O = 16) of 138. Its melting point is between that of antimony (840° F.) and silver (1740° F.). It has a specific gravity of 6.16, and a specific heat of 0.0448. It is a white metal, moderately ductile and malleable. It oxidizes rapidly upon exposure to the air, and decomposes water slowly when cold, and rapidly when hot. It dissolves readily in acids, with the formation of corresponding salts, which are mostly colorless, with an astringent taste. The metal is prepared by the reduction of its chloride by metallic potassium, and the subsequent removal of the potassium chloride that is formed, by washing with alcohol. Neither lanthanum nor its salts are of any industrial importance. The name is from a Greek word meaning «concealed,» in allusion to the fact that lanthana, the oxid, was for a time confused with the oxids of other rare metals belonging to the cerium group. Lanthanum occurs, as a silicate, in the minerals cerite, gadolinite, orthite, and allanite; as a carbonate in lanthanite occurring in Lehigh County, Pa., and Essex County, N. Y.

Lanza, län'zä, **Gaetano**, American mathematician and engineer: b. Boston 26 Sept. 1848. He was educated at the University of Virginia, and for two years was an instructor there; has been an instructor and assistant professor at the Massachusetts Institute of Technology; since 1875 professor of theoretical and applied mechanics; also since 1883 in charge of the department of mechanical engineering. He is a fellow of the American Academy of Arts and Sciences, a member of the British Association for the Advancement of Science, and of other scientific bodies here and in Europe. He has published 'Applied Mechanics' (1885), and his writings include many papers presented to scientific societies.

Lanzarote, lăn-thä-rō'tā, one of the Canary Isles, about 90 miles from the African coast; greatest length, 36 miles; breadth, 15 miles. Its coast is in general very bold, and presents ranges of basaltic cliffs rising in some parts to 1.500 feet; its interior contains several mountains, the loftiest of which has a height of 2,000 feet. The only port of any consequence is Arrecife. Pop., 16,409.

Laoag, lä-wäg', Philippines, capital of the province of Ilocos Norte, Luzon, on the Grand de Laoag River, 4 miles from its mouth. It is picturesquely situated in a fertile plain and is well built; it is open to the coastwise trade and is the centre of shipment for the agricultural products of the region. The name signifies «clearness» from the fact that the sky and atmosphere are almost continuously clear. Pop. 37,000.

Laocoon, lā-ŏk'ō-ŏn, a priest of Apollo at Troy. As he was sacrificing a bull to Poseidon on the shore, two serpents swimming from the Island of Tenedos advanced to the altar. The people fled, but Laocoon and his sons fell victims to the monsters. The sons were first attacked, and then the father. Winding themselves round him, the serpents raised their heads high above him, while in his agony he vainly endeavored to extricate himself from their folds. They then retired to the Temple of Pallas Athene, where they took shelter under her shield. The people saw in this omen Laocoon's punishment for his impiety in piercing with his spear the wooden horse consecrated to Athene. The story has frequently furnished a subject to the poets, but it is chiefly interesting to us as having given occasion to a fine work of sculpture — the Laocoon group, now in the Vatican. It was discovered in 1506 on the site of the baths of Titus. Pope Julius II. bought it and placed it in the Vatican. Its preservation was perfect, except that the right arm of Laocoon was wanting: this was restored by a pupil of Michelangelo. This group is of the dramatic Rhodian school, and by no means belongs to the best style of Greek sculpture. Yet is has been much treated of in literature, especially by Goethe, Heine, Lessing, Winckelmann, and Herder. It represents three persons in agony, but in different attitudes of struggle or fear, according to their ages. Pliny declares it was made of one stone by the sculptors Agesander, Polydorus, and Athenodorus, all natives of Rhodes, and the two latter, probably sons of the former.

Lessing makes it probable that those three artists lived under the first emperors. It may be fairly doubted whether the statue mentioned by Pliny is the same as that we now have; acute observers have found that the group does not consist of one block, though the junctions are carefully concealed. To this it may be answered that they were not perhaps perceptible in the time of Pliny. Several copies have been made; one in bronze, from a model by Giacopo Tatti or Sansovino. which was carried to France. Bacio Bandinelli made a copy which is in the Medici Gallery at Florence.

Laodamia, daughter of Acastus and Astydamia. Her affection for her husband, Protesilaüs, who, by decree of fate, was the first Greek to die at Troy, led her to follow him to the lower world.

Laodicea, lā-ŏd-ĭ-sē'ạ, the ancient name of four places in Asia Minor. (1) Laodicea, now called by the Turks *Eski Hissar* (Old Castle), an ancient ruined city, once the capital of Greater Phrygia, 120 miles east of Smyrna, the site of one of the seven primitive Christian churches of Asia. Nothing but very extensive ruins of inferior architectural merit remain to point out the locality of this interesting city. (2) See LATAKIA. (3) Now Ladik, a city of Lyconia, north of Iconium. (4) An ancient city of Syria, founded by Seleucus Nicator, which stood to the northeast of Baalbec, in a plain watered by the Marsyas.

Laos, lā'ōs, a territory in the Indo-China peninsula surrounded by the Shan states, Anam, Tonkin, and the Chinese province of Yun-nan. Its extent and the number of its inhabitants are unknown, but they have been estimated at one and a half million. The country is intersected by mountain ranges and traversed by the Mekong or Cambodia River, the alluvial valley of which produces abundant sugar, rice, tobacco, etc. Laos exports to the neighboring states a considerable quantity of ivory, gold, silver, precious stones, silk, etc. The inhabitants are reported to be connected with the Burmese in their racial, social, and religious peculiarities. The capital is Ching-Mai.

Laosaurus, lā-ō-sâ'rŭs, a genus of unarmored, herbivorous dinosaurs (q.v.) of the suborder *Ornithopoda*, whose remains are found fossil in the Jurassic rocks of western North America.

Lao-tse, lä'ō-tsā, or **Lao-tseu**, Chinese philosopher: b. Kiuh-jin 604 B.C. The date of his death is unknown. He was the founder or reformer of one of the most ancient and important religious sects of China, known as the Tao, or sect of reason. He was a historiographer and librarian to a king of the Chow dynasty; traveled to the borders of India, where he may have become acquainted with Buddhism; met Confucius and reproached him for his pride, vanity, and ostentation; was persuaded to record his doctrines in a book, which he did in the 'Tao-ti-king' or 'The Path to Virtue'; and on completing this task is reputed to have disappeared into the wilderness, and there ascended to heaven. According to him silence and the void produced the Tao, the source of all action and being. Man is composed of two principles, the one material and perishable, the other spiritual and imperishable, from which he emanated, and to which he will return on the subjugation of all the material passions and the pleasures of the senses. Lao-tse's moral code is pure, inculcating charity, benevolence, virtue, and the free-will, moral agency, and responsibility of man. Since the 2d century of our era the sect has continued to extend over China, Japan, Cochin-China, Tonquin, and the Indo-Chinese nations.

La Paz, lä päs (Sp. lä päth), a department of Bolivia, bounded on the north by Brazil, on the east and south by the departments of Beni, Cochabamba, and Oruro, and on the west by Peru. Its area has never been accurately determined; according to a recent conservative estimate it is 75,742 square miles. Extensive tracts in the northern portion are still unexplored, and the boundary disputes with Brazil and Peru add a large element of uncertainty. Calculations based upon the extreme Bolivian claims give the fabulous area of 275,413 square miles. The department is divided into 9 provinces, as follows: La Paz, Yungas, Larecaja, Muñecas, Campolican, Omasuyos, Pacajes, Sicasca, and Inquisivi. Each provincial capital has a municipal council and is administered by a sub-prefect. The provinces are subdivided into cantons, administered by corregidores. The entire department is subject to a prefect, representing the national government. Some of the highest peaks of the Bolivian Andes rise above the great Titicaca basin (itself 13,000 feet above sea-level) in the southern half of this department, which portion has a temperate and moderately salubrious climate (see La Paz, the capital, etc.). Chief products are copper, silver, tin, gold, coca, wheat, maize, barley, potatoes; in the torrid lowlands of the north, sugarcane, rice, tobacco, and coffee; and from the forests along the tributaries to the Amazon are obtained rubber and cinchona. Cattle and sheep are bred in large numbers on the upland pastures. The census of 1 Sept. 1900 shows the population to be 423,800.

La Paz, Bolivia, capital of the department of the same name, and, temporarily, of the republic (see Sucre). It is the metropolis and commercial centre of Bolivia, situated in the Quebrada del Choqueyapu, 650 feet lower than Lake Titicaca (from which the distance by road is about 45 miles) and yet quite 12,250 feet above the level of the sea. The latitude of La Paz is 16° 29′ 54″ S., lon. 68° 29′ 38″ W., and mean annual temperature about 50° F., or somewhat less than that of Paris. The annual range of temperature at La Paz, however, is very different from that at Paris, the summers being less hot, the winters less cold, and the extremes of temperature 19.4° F. to 73.4° F. The clearness of the sky occasions rapid loss of heat by radiation; the nights are therefore much colder than the days. Though the thermometer often falls below freezing-point, plants are rarely frozen, for the reason that the air at this great height is very dry. It is a substantially built but unimpressive city, with ill-paved streets rising at a steep grade from the small river which flows through its midst; it has, however, a beautiful Alameda or promenade, a cathedral, many churches, and some noteworthy public institutions — a museum, library, university, professional schools of various kinds, and courts. Up to 1903 the city remained without railway connections, the nearest stations on existing lines of railway being Oruro, terminus of the line from Antofagasta, and Puno on Lake Titicaca; to the latter point a railway was being constructed. Lines of telegraph connect La Paz with Oruro, Cochabamba, Colquechaca, Puno, and Santa Cruz. According to the census of 1900, the population is 57,000.

La Paz, Mexico, capital of the southern district of the territory of Baja California, the capital of the northern district being Ensenada de Todos Santos. It is pleasantly situated between the coast range and the bay, and has commercial dealings principally with San Francisco, Mazatlán, Guaymas, San Blas, and Manzanillo. Pop. 4,737.

Lapeer, lạ-pēr′, Mich., city and county-seat of Lapeer County, on the Michigan C. and the Grand T. R.R.'s, 60 miles north of Detroit, 45 miles west of Port Huron, and 41 miles south of Bay City. It was first settled in 1836 by A. N. Hart and was incorporated as a city in 1868. The municipal government is administered by a mayor and city council of 8 members elected every two years. The city has four banks, capital $250,000, and has numerous large factories, stone works, planing mills and iron foundries. The Michigan Home for the Feeble Minded is located here; also the Lapeer Business College, High School, and various church buildings. Pop. (1890) 2,753; (1900) 3,297.

E. T. Woodruff,
Editor of the 'Clarion.'

La Perouse, Jean François de Galaup de, zhŏṅ fräṅ-swä dė gä-lōp lä pā-rooz, French navigator: b. near Albi, Languedoc, France, 22 Aug. 1741; d. after 1788. He served in the French navy against England (1778–83) and sailed in August 1785 with two ships on an exploring expedition to the Pacific, and by sailing through La Perouse Strait, between Saghalien and Yezo, discovered that each of these was a separate island. In February 1788 he sailed from Botany Bay; and after this no more was heard from him. In 1826 it was fully ascertained by the English Captain Dillon that both of the French ships had been wrecked in a storm on a coral reef off Vanikoro, an island lying north of the New Hebrides, and in 1898 a few relics of his party were found there. An account of the early portions of La Perouse's voyage prepared from journals sent home by him, was published under the title of 'Journey Round the World.'

La Piedad, lä pē-ā-däd′, Mexico, town in the state of Michoacan, near the northern boundary, on the Lerma River, 62 miles southwest of Guanajuato. It is the centre of a large agricultural district. A fine bridge crossed the Lerma at this point. Pop. (1901) 11,200.

La′pis-laz′uli, the sapphire of the ancients, is a highly prized ornamental stone. It was long supposed to be a simple mineral, but now has been shown to be a variable mixture of lazurite, haüynite, diopside, amphibole, muscovite, calcite, pyrite and other minerals. The most important mineral in the stone is lazurite, which is itself a highly complex compound, essentially $Na_4(Na\ S_3.\ Al)Al_2Si_3O_{12}$, but containing also in molecular combination varying amounts of haüynite and sodalite. Lazurite is usually massive, has a hardness of 5 to 5.5, a specific gravity of 2.45, and rich azure-blue color. Its most important localities are in Siberia, Persia, China, and Chile.

Lapithae, a mythical race of Thessaly, whose struggles under the leadership of their king, Pirithoüs, against the Centaurs are a frequent subject in art and literature. The final contest was due to the unsuccessful attempt of the Centaurs to carry off Hippodamia, the bride of Pirithoüs, at their marriage-feast.

Laplace, Pierre Simon, pē-ār se-môñ lä-plās, MARQUIS DE, French mathematician and astronomer: b. Beaumont-en-Auge (Calvados) 23 March 1749; d. Paris 5 March 1827. He studied the higher mathematics at the academy of Beaumont, in 1767 went to Paris, and there by the influence of D'Alembert became professor of mathematics in the Ecole Militaire. By his brilliant memoirs on the theory of probability he attracted wide notice, and in recognition was elected ***membre-adjoint*** (1773) and titular member (1785) of the Academy of Sciences. He was appointed examiner in the Royal artillery corps (1784), and professor of analysis at the Normal College (1794); and in 1816, for the elegance of his style in the 'Exposition du Système du Monde' (1796) was admitted to the Académie Française, of which in 1817 he became president. Appointed by Napoleon minister of the interior (1799), he was shortly dismissed, being, according to the Emperor, «below mediocrity as a minister,» and aiming to «conduct the government on the principles of the infinitesimal calculus.» He was, however, given a seat in the Senate, became its vice-president, and in 1803 chancellor. He also held the post of president of the bureau of longitudes, and was a member of the commission for the establishment of the metric system. Nichol called him the «titanic geometer,» and he has been styled also «the Newton of France.» Among the more important of his remarkable investigations are the discovery of the inequality in the movements of Jupiter and Saturn; his researches in probabilities (contained in the 'Théorie analytique des Probabilités' 1812, and the 'Essai Philosophique sur les Probabilités' 1814); his improvements in the lunar theory; and his theory of the tides. His chief work is the great 'Mécanique céleste' (1799–1825), a compendious solution of the problems of physical astronomy, and one of the greatest contributions ever made to science. It was translated into English by Nathaniel Bowditch (q.v.) (1829–39), who said: «Whenever I meet the words of *il est aise à voir* [it is easy to see] I am sure that hours and perhaps days of hard study will be necessary.» A collection of Laplace's works in 13 vols. was made by the French government (1878 et seq.). Consult the life by Kaufman (1841); and Arago, 'Biographies of Scientific Men' (in Eng. trans. 1859).

Lap'land, an extensive territory in the north of Europe, between lat. 64° and 71° N., and from the shores of Norway east to those of the White Sea; area, about 130,000 square miles, of which more than a half belongs to Russia; and the remainder is shared in nearly equal proportions between Sweden and Norway. Both from its geographical position and its physical conformation Lapland, or the country of the Lapps, is one of the most forbidding regions of the globe, consisting either of rugged mountains, some of them covered with perpetual snow, and many of them only for a short period free from it, or of vast monotonous tracts of moorland wastes. This extensive territory appears to have been at one time wholly occupied by the people to whom it owes its name; but its southern and better portions have been gradually encroached upon by Norwegians, Swedes, and Finlanders. The Lapps call themselves Sabme or Sabmeladsjak (the Norwegians call them Finns), belong to the Ural-Altaic stock, and are consequently closely related to the Finns (Suomi). As a race they are the shortest people in Europe (four or five feet in height). They are spare of body, with dark, bristly hair and scanty beard, and short, often bandy, legs. Though not very muscular they are capable of great exertion and fatigue, and frequently live to a great age. The mouth is large, the lips thick, and the eyes small and piercing. The Lapps are usually distinguished as Mountain, Sea, Forest, and River Lapps. The Mountain Lapps, the backbone of the race, are nomads; they move constantly from place to place in order to find sustenance for their reindeer herds, their only source of wealth. In summer they go down to the fiords and coasts, but spend the rest of the year in the mountains and on the plains of the interior. The Sea Lapps, mostly impoverished Mountain Lapps, or their descendants, dwell in scattered hamlets along the coast, and live by fishing. The Forest and River Lapps are nomads who have taken to a settled mode of life; they not only keep domesticated reindeer, but hunt and fish. The nomad Lapps live all the year round in tents. The reindeer supplies nearly all their wants, except coffee, tobacco, and sugar. They live on its flesh and milk; they clothe themselves in its skin, and use it as a beast of burden. It is computed that there are 400,000 reindeer in Lapland, for the most part semi-wild. In his personal habits and in his clothing the Lapp is the reverse of cleanly. He is, however, very good-natured, rather prone to self-indulgence, and miserly and selfish. His imagination is easily excited, and he is readily susceptible to religious impressions of a sensational type; a notable «epidemic» occurred at Koutokeino in Norwegian Lapland in 1848–51. The Lapps all profess Christianity; those of Norway and Sweden belong to the Lutheran Church, those of Russia to the Greek Church. The Norsemen treated the Lapps as a subject race as early as the 9th century, but had to reconquer them in the 14th; the Russians followed in the 11th, and the Swedes in the 16th. From the 13th to the 17th century the Lapps were kept in a state little better than slavery by Swedish adventurers known as Birkarlians. But at the present day both the Scandinavian governments bestow on them every consideration. The number of Laplanders is not supposed to exceed 25,000 of all descriptions, of whom Norway has nearly 15,000, Sweden about 7,000, the rest belonging to Russia. Probably one third of them are nomadic. Consult: Du Chaillu, 'Land of the Midnight

Sun’ (1881); Tromholt, ‘Under the Rays of the Aurora Borealis’ (1885); ‘The Testimony of Tradition’ (1890).

Lapland Longspur. See LONGSPUR.

La Plata, lä plä'tä, Argentine Republic, the new capital of the province of Buenos Ayres. The important question of the location of the capital of the republic was not settled by law until Gen. Julio A. Roca became president. By custom, however, Buenos Ayres was the seat of the national government, and of the provincial government as well. This anomaly was ended during President Roca's first term. Congress passed a law by which the city of Buenos Ayres was declared to be the capital of the republic; the legislature of the province of Buenos Ayres decided to build a new city, which should be the provincial capital. The cornerstone of La Plata was laid on 19 Nov. 1882, in a barren waste a few miles from the village of Ensenada and about 24 miles below Buenos Ayres, on the south shore of the Rio de la Plata. The port of La Plata, built in Ensenada, is in communication with the city by means of a railroad and a canal, which is navigable by seagoing vessels. In less than three years from the date of its foundation the new capital had a population of 30,000, and, in addition to the public buildings, 3,631 brick and stone houses were either completed or in course of construction. It is said that the public buildings alone have cost about $40,000,000. The city is laid out on the same plan as Washington, D. C., with diagonal avenues 97½ feet wide, streets 58½ feet wide; and 23 public squares. Among the principal buildings are: the Government House, Treasury Department, Capitol, City Hall, Police Department, Provincial Bank, Hypothecary Bank, Bourse, Department of Engineers, Department of Justice, Museum and Public Library, Astronomical Observatory, Great Central Railway Station, etc. There are several handsome churches, two theatres, and a race-course. Railways connect this port with nearly every province of the republic. Permanent residents in 1901 numbered 35,410, and in addition there is a large floating population.

La Plata, Rio de, rē'ō dā, an estuary on the southeastern coast of South America, between Uruguay and Argentina; an outlet for the united waters of the Paranå and Uruguay rivers. The enormous outflow, which in volume is exceeded only by that of the Amazon, creates powerful currents; treacherous shallows are formed over the washings brought down from the interior of the continent; and the low-lying southern shores afford no shelter from storm winds. Therefore navigation in this estuary, which is 143 miles wide at its mouth, and about 190 miles long, narrowing gradually above Montevideo and Buenos Ayres, combines the perils of river and open sea. On the north shore there is one good natural harbor — that of Montevideo; on the Argentine side well-directed efforts are being made to supply natural deficiencies by building massive docks, dredging deep-water channels, and completing other extensive harbor improvements (see ARGENTINA, BUENOS AYRES, and LA PLATA). The region to which the Rio de la Plata, with the Uruguay, Paraná, and Paraguay rivers, gives access, is of vast extent. In the later years of Spanish dominion it was comprised in the viceroyalty of La Plata, from which the states of Argentina, Uruguay, Paraguay, and Bolivia have been carved; and to-day the southern portions of that region sustain some of the most progressive of all Latin-American communities. Early in the last century Great Britain attempted to secure control of this continental gateway, a position which, as it now appears, would have enabled her to win in the south a colony possessing very great resources — another Canada, at least. In 1806, when England and Spain were at war, Spain being the ally of Napoleon, Major-General William Carr Beresford, with about 1,600 men, arrived off Buenos Ayres, and captured the city quite easily. But a few weeks later the invaders were driven out. A much larger army, commanded by General Whitelocke, was sent in 1808 to recapture Buenos Ayres, and a separate force succeeded in taking possession of Montevideo. But the British were defeated on the south shore; General Whitelocke capitulated on the day of the attack, withdrew to his ships, and surrendered Montevideo.

MARRION WILCOX,
Authority on Spanish America.

Laporte, lạ-pōrt', Ind., city and county-seat of Laporte County, on the Chicago & W. M., Lake Erie & W., and several other railroads; 59 miles east of Chicago. It is the farming trade centre for the county; and is also engaged in the manufacture of woolen goods, agricultural implements, wheels, hubs, etc. It is an attractive summer resort, having several beautiful lakes in its vicinity; contains a handsome court house, city hall, St. Rose's Academy, and public library; and has an electric-light plant, waterworks supplied from one of the lakes; several churches, National and State banks, daily, weekly, and monthly periodicals, and an assessed property valuation of nearly $4,000,000. In the winter large quantities of ice are cut at the lakes here and shipped to Chicago. Pop. (1890) 7,133; (1900) 7,126.

Lap'wing, a plover (*Vanellus vanellus*) found throughout temperate Europe and Asia, across the whole breadth of which it breeds. In the summer a few are found as far north as Norway, Iceland and Greenland, and in winter they migrate for the most part to Africa, and India. In its habits the lapwing much resembles the American killdeer; and, like that bird, it is hated by gunners on account of its alarm-cries. This pursuit and the market demand for its flesh, and more especially for its eggs, have greatly reduced its numbers, especially in Great Britain. The lapwing is noteworthy for the long flowing crest on the head, the contrasting white and deep iridescent green of its plumage, and for its peculiar jerking, yet rapid flight.

Lap'worth, Charles, English scientist: b. Faringdon, Berkshire, 1842. He was trained as a schoolmaster at Culham College, taught at Galashiels, Scotland, 1864 to 1875, at St. Andrews, 1875 to 1881, and at Birmingham University. In 1892 he became president of the geological section of the British Association in Edinburgh. His great work has been in the field of theory with regard to ‘rock-fold,’ and the investigation of graptolites. Among his works are: ‘The Geological Distribution of the Rhabdophora’ (1880); ‘Intermediate Text-Book of Geology.’

Laramie, lăr'a-mē, Wyo., city and county-seat of Albany County, on the Laramie River and the Union Pacific railroad; 58 miles west of Cheyenne, the State capital. It is the shipping and trade centre for a large stock-raising and mining section; and is also engaged in manufacturing; has large deposits of gold, silver, lead, graphite, antimony, cinnabar, and other minerals, and rolling mills, lime-stone quarries, plaster mills and railroad and machine shops. It is the seat of the University of Wyoming, the State fish hatchery, Agricultural Experiment Station, and the State penitentiary; contains public and college libraries and St. Joseph's Hospital; and has electric light plants, water-works, daily and weekly newspapers, and an assessed property valuation of over $1,500,000. Laramie was first settled in 1867 by employees of the Union Pacific railroad, incorporated in 1869 and chartered as a city in 1884. The municipal government is vested in a mayor and a council of six members elected biennially. Fifty per cent of the population are American born, 20 per cent Scandinavian and 10 per cent German. The city owns and operates the waterworks. Pop. (1890) 6,388; (1900) 8,207.

W. E. Chaplin,
Editor of the ‹Republican.›

Laramie Mountains, a Rocky Mountain range which extends through Wyoming and Colorado, and bounds the Laramie Plains on the east. The highest point is Laramie Peak, 10,000 feet high. Coal is the principal mineral found in this range.

Laramie Plains, a plateau in southern Wyoming, about 7,500 feet above sea-level.

Laramie River, an important stream rising in northern Colorado and flowing into the North Platte at Fort Laramie in Wyoming. Its length is about 200 miles.

Lar'ceny, the fraudulent appropriation of the personal property of another person without that person's consent. To constitute this crime the removal of the goods to any distance is not necessary, but it requires to be shown that the article has completely passed, for however short a time, into possession of the criminal. Concerning the kinds of things the appropriation of which is larceny, the common law restricted them to personal property as distinguished from real estate, but this distinction has been largely abolished by recent statutes. At one time in Great Britain the punishment for grand larceny was death; later it was restricted to transportation; now the punishment for larceny is imprisonment, the same as in the United States, and depends on the previous character of the prisoner. See also Theft.

Larch, a genus (*Larix*) of coniferous trees characterized by a pyramidal habit of growth; small linear leaves arranged in clusters upon the older branches, singly and spirally upon the young twigs, often conspicuous pistillate flowers which develop small, erect, globose or oblong cones, the attenuated scales of which are not deciduous at maturity. The species, of which there are less than a dozen, are natives of the colder parts of the northern hemisphere. The best known one in the United States is the American larch, hackmatack or tamarack (*L. Americana*), which grows generally in wet, peaty soils and shallow swamps, or occasionally upon drier upland soils, from Hudson Bay to Pennsylvania, and westward to Manitoba and Illinois. It attains a height of 60 or more feet, and has nearly horizontal branches. Its wood is hard and very durable, but light in proportion to its size. Being very straight and slowly tapering, the trunks are much used for telegraph poles, scaffold-supports, fence-posts, railway-ties, and in ship-building. It is less planted for ornamental purposes than the following species because its branches are less pendulous and less leafy.

The European larch (*L. decidua* or *L. europæa*) grows usually upon dry uplands and a wide range of soils, but rarely in moist ground. Its range is from the mountains of southern Europe to the far north, where it is among the few hardy trees; in Asia it has a similar distribution. In height it exceeds the tamarack, often reaching 100 feet, and since it is of rapid growth, and is used for an even larger number of purposes than the preceding, it is often planted for commercial purposes, windbreaks, and for ornament. The timber which is rich in resin and is practically exempt from insect attacks, is valued for wet situations. It is little used for planks because it warps badly. Since it does not ignite readily and does not splinter it was largely used in wooden battle-ships. Its bark, which contains tannin, is somewhat used for making leather; its stems yield Orenburgh gum resembling gum arabic; and its leaves in warm climates exude Brançon manna, a sweetish, turpentine-flavored manna (q.v.).

The other species more or less resemble the foregoing in habit and uses. The most beautiful and ornamental is probably *L. leptolepis*, a native of Japan. It attains heights of 70 and 80 feet and is remarkable for the brilliant autumn colors of its foliage. All the species except the Himalayan larch (*L. griffithii*), which seldom exceeds 40 feet in height, are hardy throughout the United States. The timber of the western larch (*L. occidentalis*), a native of the Pacific Coast region from Oregon northward, is considered the best yielded by coniferous trees. The tree is the largest of the genus, often reaching a height of 150 feet.

The only insect seriously harmful to the larch is a sawfly (*Nematus erichsonii*), whose young hatch in early summer from eggs previously inserted into the young shoots, and immediately begin feeding upon the leaves. This pest is occasionally sufficiently numerous to defoliate large tracts of forest.

Larcom, Lucy, American poet: b. Beverly, Mass., 1826; d. Boston 17 April 1893. In her youth she was a factory girl in Lowell, Mass., and to the ‹Lowell Offering,› a magazine conducted by the operatives in the cotton-mills, made contributions which attracted the favorable notice of Whittier. For three years she studied at Monticello Seminary (Godfrey, Ill.), for six taught in Wheaton Seminary (Norton, Mass.). She was editor-in-chief of ‹Our Young Folks,› a Boston magazine, later merged with ‹St. Nicholas,› in 1865–74. She edited several collections of verse, and published ‹Ships in the Mist, and Other Stories› (1859); ‹Poems› (1868); ‹An Idyl of Work, a Story in Verse› (1875); ‹Childhood Songs› (1877); and ‹Wild Roses of Cape Ann, and Other Poems› (1880); ‹A New England Girlhood Outlined from Memory,› an autobiography

(1899). Her collected poetical works appeared in 1884. Her poems of New England life were especially effective, perhaps the best-known being ‘Hannah, Binding Shoes.’ Consult: Addison, ‘Life, Letters, and Diary of Lucy Larcom’ (1894).

Lard, the melted and strained fat of swine, which differs in its situation from that of almost every other quadruped, as it forms a thick, distinct, and continued layer betwixt the flesh and the skin, somewhat like the blubber in whales. The greater part of the finer sorts of the lard of commerce is procured from the abdominal part of the animal. Lard is rather soft, white, and readily fusible at 100° F. It consists of stearine, which is a solid, and oleine, which is a liquid fat; but it usually contains small quantities of impurities, and it is to them probably that it owes its becoming occasionally rancid. It is used as a lubricant, but it is sometimes mixed with oils of better quality as an adulterant.

Larderel'lite, a native hydrous borate of ammonium, crystallizing in the monoclinic system, and having the composition $(NH_4)_2O.4B_2O_3.4H_2O$. It occurs at the Tuscan lagoons, and was named for Larderel, a Tuscan borax manufacturer. The mineral gives off ammonia when heated, and is used, to a certain extent, as a commercial source of ammonia.

Lard'ner, Dionysius, Irish physicist: b. Dublin 3 April 1793; d. Naples 29 April 1859. He was graduated from Dublin University in 1817 and was made professor of astronomy and physics in the University of London in 1828. From 1840 to 1845 he lived in the United States, where he gave popular scientific lectures in many towns. He wrote several notable mathematical treatises; and edited, himself becoming one of the chief contributors, a ‘Cabinet Cyclopædia’ (134 vols., 1829–46). Among his other writings are: ‘Manual of Electricity,’ etc. (1841); ‘Treatise on Heat’ (1844); ‘The Steam Engine’ (1852); ‘Natural Philosophy and Astronomy’ (1851–2).

Lareau, lă-rō', **Edmond,** Canadian author: b. St. Gregoire, Quebec, 12 March 1848; d. 1890. He was educated at the College of Ste. Marie de Mannoir, at Victoria College, and at McGill University, and was admitted to the bar in 1870. In 1876 he became professor of law in McGill University, and in 1886 was elected in the Liberal interest to the provincial legislature from Rouville County. His works, written in French, include histories of Canadian law (1872), and literature (1874), and ‘Historic and Literary Miscellanies’ (1877).

Laredo, lă rā'dō, Texas, city, county-seat of Webb County; on the Rio Grande, and on the Mexican N., the International & G. N., and the Rio Grande & E. P. R.R.'s; about 150 miles west of San Antonio. It is situated in an agricultural and stock raising region, and in the Rio Grande coal belt, with valuable iron ore deposits in the vicinity. Laredo was settled by the Spaniards in 1767, and was incorporated in 1848. The Spaniards found here Indians who tilled the soil and built houses. The early missionaries established here a mission some years before a permanent settlement was made. The chief manufacturing establishments are extensive concentrating and sampling works, brick yards, furniture factories, foundry and machine-shop products, stock-yards, grain-elevators, and large coal yards. It is the trade centre for a large section of the southwestern part of Texas. It is connected with Nuevo Laredo, on the Mexican side of the Rio Grande, by bridges. Some of the prominent buildings are the court-house, the jail, the Mexican National Hospital, the Mercy Hospital, and the Ursuline Convent. It is the seat of the Laredo Seminary, established in 1882, under the auspices of the Methodist Episcopal South Church, and the Ursuline Academy. The park of 65 acres is an attractive feature of the city. Pop. (1900) 13,429.

Lares, plural of the Latin word *lar,* tutelary divinities of the Romans, originally either the spirits of ancestors who watched over the family of a descendant, or, according to a perhaps more probable view, gods of the lands on which the man's house stood, and only later household gods. We have mention of *lares compitales* whom country people honored with a yearly festival at shrines erected at crossroads, but more frequently of the lares of the home, to whom prayer and sacrifice were offered at the daily meals as well as on all festal occasions. Their figures were kept in a little shrine, often in a special chapel in the house. There were also public lares whose worship, associated with that of the emperor, became important under Augustus and later.

Lar'iat. See Lasso.

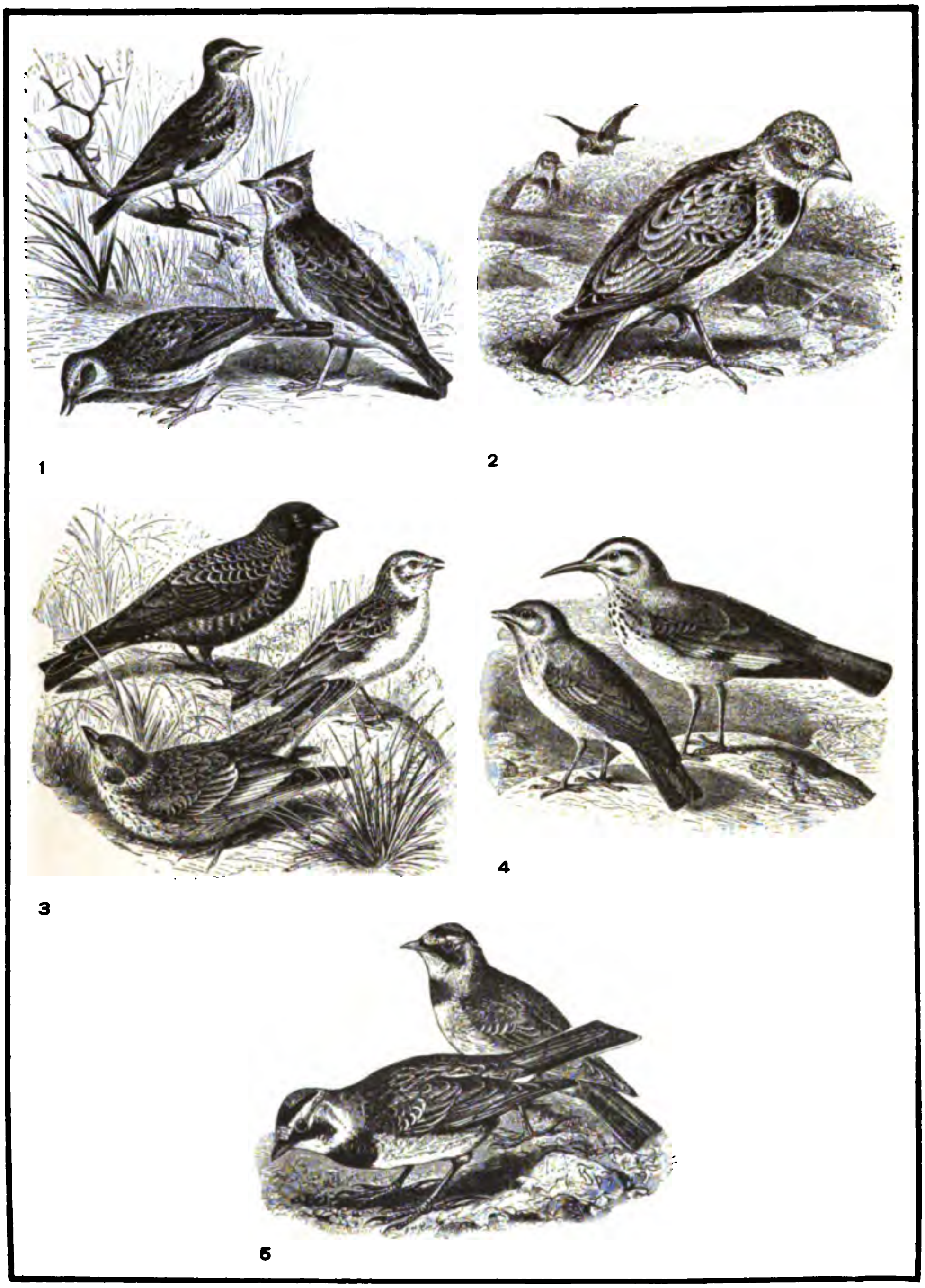
Lar'idæ, the family of sea-going birds which includes the skuas (*Stercorarinæ*), gulls (*Larinæ*), skimmers (*Rhynchopinæ*), and terns (*Sterninæ*); but some naturalists regard the skuas and skimmers as each of family rank. They are practically cosmopolitan, although the great majority are restricted to sea-coasts.

Lariosaurus, lăr-ĭ-ō-sâ'rŭs, a genus of fossil reptiles, of the family *Nothosauridæ,* allied to the plesiosaurs, which were lizard-like in shape, rarely a yard long, and had heads of moderate size with numerous prehensile teeth. Nearly complete skeletons of *L. balsami* are obtained from the black Triassic shales near Lake Como, and from the German Muschelkalk. Consult Woodward, ‘Vertebrate Paleontology’ (1898).

Larissa, lă-rēs'ă, Greece, city in Thessaly, on the Salamvria River, 35 miles northwest of Volo, with which it is connected by railway. It was celebrated in ancient times for its bull-fights, and was the rendezvous place of Julius Cæsar's army before the battle of Pharsalia. It is now the largest, richest, and most populous city in Thessaly, and the seat of a Greek archbishopric. Pop. 15,373.

Lark, a bird of the family *Alaudidæ.* Larks are small, ground-keeping birds, with small awl-like beaks, the long tarsi scutellated posteriorly, and the claw of the hind toe usually greatly lengthened; the wings vary much in length, but are usually short, as also is the tail. The normal coloration is light brown with darker longitudinal streaks, the under parts being whitish and the breast usually spotted. There is frequently a crest, or decided blackish marks about the head; while the desert forms are, as usual, pale and ornamented. Larks dwell in open grassy places, making their nests on the

LARKS.



1. Wood-lark, Sky-lark and Crested Lark.
2. Alanda calandra.
3. Alanda yeltoniensis; A. sibirica; A. brachydactyla.
4. Desert Larks.
5. Horned Lark.

ground or among rocks, sometimes elaborately; and laying spotted eggs; they are sociable, but hardly gregarious. Some frequently perch on trees, and most of them soar while singing, as is well known of the sky-lark (q.v.); and the song of many resembles that of this renowned musician. It is a physiological peculiarity of the family that larks molt only once a year. The food consists of insects and their larvæ, worms, small seeds, buds, berries, etc. The flesh of all is considered a dainty, and great numbers are caught annually on both sides of the Mediterranean to be sold in the markets. The family includes about 100 species, divided among about a dozen genera, of which only one, *Otocorys,* with probably but a single species (the horned lark, q.v.) is found in America, and only a single species occurs in Australia. The remainder of the family belongs to Europe, Asia, and Africa, where familiar types are the sky-lark and wood-lark (qq.v.).

The name is also given to many more or less similar birds of other families, as to several of the pipits and Old World warblers; while the meadow-lark (q.v.) of the United States is a starling.

Lark-bunting, a fringilline bird of the western plains of the United States, the male of which in summer is solid black, except a conspicuous white patch on the wings, and the female brown-streaked. The habits of the pair are terrestrial, and the male soars in singing after the manner of the sky-lark and with some similarity in notes. A very different bird, one of the smaller plains sparrows (*Chondestis grammaca*), is known as the lark-finch. Consult Keyser, ‘Birds of the Rockies’ (1902).

Larkspurs, a genus (*Delphinium*) of annual and perennial herbs of the order *Ranunculaceæ,* characterized by palmately lobed or divided leaves, and showy racemes or panicles of large irregular flowers. Many of the species, of which there are about 60 in the north temperate zone, are cultivated for ornament, and have developed numerous improved varieties, some of which are double-flowered. The most popular annual species is *D. ajacis,* which attains a height of about 18 inches and bears showy blue or violet, sometimes white flowers throughout the summer. Of the perennial species, *D. formosum, D. grandiflorum* and *D. hybridum* are most popular in America, and have yielded the largest number of horticultural varieties. They are all natives of Asia, become two to four feet tall, blossom during mid-summer, and are noted for their beautiful tints of blue, their hardiness and ease of cultivation. If cut down immediately after flowering they often blossom a second time before frost. Among the best known American species are *D. menziesii, D. scopulorum* and *D. nudicaule,* which range from the Pacific Coast to the plains region; and *D. exaltatum, D. tricorne* and *D. carolinianum,* found most commonly east of the Mississippi. The larkspurs thrive best in rich, deep, sandy loam well exposed to the sun. The annuals are propagated from seed, as are many of the perennials, which are also increased by cuttings taken in early spring or from second growth in summer. Established clumps may be divided in fall or spring. Since the seeds are very slow in germinating they are usually sown in autumn out of doors, or in early winter in a greenhouse.

Larned, lär′nĕd, **Augusta,** American author and journalist: b. Rutland, N. Y., 16 April 1835. She was educated at the Watertown and Potsdam seminaries and at Spingler Institute, New York; has been contributor and correspondent to periodicals; editor of the ‘Revolution’ (woman's rights); editorial writer for the ‘Christian Register,’ Boston, for many years; and is author of the ‘Roundabout Road’ series of papers which appeared in the New York *Evening Post.* She has also published ‘Home Stories’; ‘Talks with Girls’; ‘Tales Retold from Grecian Mythology’; ‘The Norse Grandmother’; ‘Tales from the Eddas’; ‘Village Photographs’; and ‘In Woods and Fields.’

Larned, Josephus Nelson, American author and librarian: b. Chatham, Ontario, Can., 11 May 1836. He was a member of the editorial staff of the Buffalo *Express* 1859–69; and editor, 1869–72; he was then superintendent of public education in Buffalo for a year, and in 1877 became librarian of the Buffalo Library, a position which he held for 20 years. He was president of the American Library Association in 1893–4. He edited and published (1902) ‘The Literature of American History,’ a bibliography, in which the «scope and comparative worth» of each book is indicated in short annotations by historical students. His other works include ‘Talks about Labor’ (1877); ‘History for Ready Reference’ (1895); ‘Talk about Books’ (1897); ‘History of England for Schools’ (1900); ‘A Multitude of Counselors’ (1901); and ‘Primer of Right and Wrong’ (1902).

Larned, Walter Cranston, American lawyer and author: b. Chicago 30 Nov. 1850. He was graduated at Harvard in 1871; studied at the Harvard Law School, 1871–2, and in Europe, 1872–4; was admitted to the bar in 1874, and has since practised in Chicago. He is the author of ‘Arnaud's Masterpiece: a Romance of the Pyrenees’; ‘Churches and Castles of Mediæval France’; and ‘Rembrandt: a Romance of Holland.’

Larned, Kan., city and county-seat of Pawnee County, at the junction of the Arkansas and Pawnee Rivers, 240 miles southwest of Topeka. It is on the Missouri P. and the A. T. & S. Fe R.R.'s, and is the shipping centre of a large farming and stock-raising country. has flour mills, grain elevators, machine shops and other industries and has electric light and waterworks. The city is governed by a mayor and council elected every two years. Pop. (1890) 1,861; (1900) 1,780.

La Rochefoucauld, François, frăṅ-swä lä rōsh-foo-kō, Duc de, Prince de Marcillac, French courtier and moralist: b. Paris 1613; d. there 17 March 1680. He entered on a military career and was engaged as an officer at the age of 16 at the siege of Casale. In the wars and intrigues of the Fronde he served the party of the parliament, took part in the defense of Bordeaux (1650), and at the end of the civil war abandoned the pursuits of ambition for a life of repose and reflection. His house became a resort of the most distinguished wits and people of culture of the time, Boileau, Racine, Molière, Madame de Sévigné, and Madame de La Fayette. The first fruits of his literary activity were his ‘Mémoires sur la Régence d'Anne d'Autriche,’ a spirited representation of that time, published

1662. In 1665 appeared anonymously the work by which he is now universally known, 'Réflexions, ou Sentences et Maximes Morales,' which passed through five editions in the course of the author's life and has been frequently republished. The best recent editions of the Maximes are those of Gilbert and Gourdault (1868–83), and Pauly (1883). The fundamental and prevailing thought in the book, that self-interest is the mainspring of all human actions, is presented with so much piquancy and variety of aspect that the reader forgives for a time the libeler of his race. His 'Correspondence' appeared in 1818. Consult Rahslede, 'Studien zu La Rochefoucauld' (1888); Bourdeau, 'La Rochefoucauld' (1895); Hemon, 'La Rochefoucauld' (1896).

La Rochejacquelein, Henri Du Verger, ŏṅ-rē dü vĕr-zhā lä rōsh-zhăk-lăṅ, Comte de, French Vendean royalist: b. Chatillon 20 Aug. 1772; d. Nouaille 4 March 1794. On the outbreak of the Revolution he retired to La Vendée, and the peasants of La Vendée having taken up arms in the royal cause, he placed himself at their head, and addressed them in the short and pithy harangue: «Let us go to meet the enemy; if I draw back, kill me; if I advance, follow me; if I die, avenge me.» After gaining 16 victories in 10 months he fell at Nouaille, shot by a Republican soldier whom he was offering quarter.

La Rochelle. See Rochelle, La.

Larousse, Pierre, pē-ār lä-roos, French encyclopædia maker: b. Toucy, Youne, 23 Oct. 1817; d. Paris 3 Jan. 1875. For several years he compiled educational text-books. In 1864 appeared the first volume of his great library of information, anti-clerical in tone, 'Grande Dictionnaire Universel du XIX. Siècle.' It was in 15 volumes, and was followed by an 'Encyclopédie du XVIII. Siècle.' He published also small condensed editions of the large works. His native town raised a statue to him in 1894.

Lar'rabee, William Clark, American Methodist Episcopal clergyman and educator: b. Cape Elizabeth, Maine, 1802; d. 1859. He was principal of Methodist academies at Cazenovia, N. Y. (1831–5), and Kent's Hill, Maine, and in 1837 was a member of the Maine geological survey. In 1840 he was appointed professor of mathematics and natural science in Indiana Asbury (now De Pauw) University, and in 1852–4 and 1856 was superintendent of public instruction in Indiana. He worked efficiently toward the improvement of educational methods in his denomination. Among the works published by him are: 'Scientific Evidences of Natural and Revealed Religion' (1850); 'Wesley and his Co-laborers' (1851); 'Asbury and his Co-laborers' (1853).

Larrabee, William Henry, American editor: b. Alfred, Maine, 20 Sept. 1829. He was graduated from Indiana Asbury (now De Pauw) University in 1845, was admitted to the bar but never entered practice, was assistant editor of 'The Methodist' of New York in 1862–5 and again in 1870–7, was associate editor of the Brooklyn *Daily Union* in 1865–70, and associate editor of the 'Popular Science Monthly' in 1879–1900. He contributed extensively to periodicals and encyclopædic publications, and wrote. with A. J. Schem, a 'History of the War in the East' (1877).

Lar'va, the young of an animal, when it differs from its parents in form and manner of life. In most invertebrates and in some of the lower vertebrates, the animal hatched from the egg is so different from the adult that in many cases the relationship was long unsuspected by naturalists, and the little creatures were given names as separate beings,—*zoëa, nauplius,* etc., now applied to the forms of larvæ they represent. These larvæ may grow by imperceptible degrees into the stature and likeness of the adult; or they may pass by comparatively sudden changes through a series of more or less different forms, until finally the adult form is reached and retained. In the latter case the development is said to be by metamorphosis (q.v.), most completely and familiarly manifested by insects. Whatever the method, the course of larval growth in its successive stages recalls the phylogeny of its race — that is, the course of its evolution in history. Thus each of the various phases of the larval life of any of the lower animals, like the fœtal life of embryos of the higher ranks, indicates probable ancestral forms. Some of the most remarkable larvæ may be mentioned. Among the marine annelids a larva known as the *trochophore* or *trochosphere* (Fig. 1) is common. It has a short compact body, traversed by the alimentary canal, and has one or more bands of cilia around the body and a sensory patch at the top of the head. By feeding, this larva grows, the increase being chiefly in length, and with this increase, the joining or metamerism of the body, so noticeable in the adult, appears. Other worms have different types of larvæ, among them the *pilidium* of the nemertines (Fig. 2), shaped

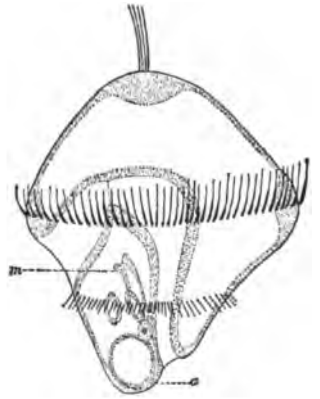


Fig. 1.— A trochophore: *a,* anus; *m,* mouth.

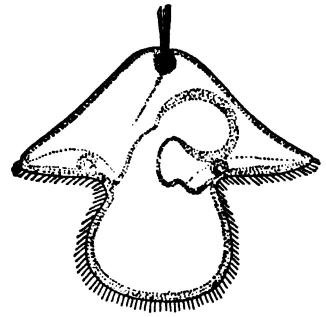


Fig. 2.—A pilidium.

somewhat like a chapeau with enormous ear lappets. Between these is the mouth which leads to a large blind sac, the stomach of the worm. The worm itself develops inside the pilidium and later escapes from it to continue its existence, leaving the rest to die.

Among the mollusks larvæ like the trochophore occur, and it is the existence of these larvæ which leads naturalists to think that annelids and mollusks, so different in the adult, had a common ancestry. Later, with the appearance of molluskan characters, a larva known as the *veliger* may appear. This is characterized by a large disk on the top of the head, which serves for a time as a swimming organ and is later lost.

All of the lower and some of the higher crustacea pass through a so-called *nauplius* stage (Fig. 3). The adult crustacean consists of several segments, but the nauplius is without joints, has a single eye, a straight alimentary canal, the mouth being overhung by an enormous upper lip, and three pairs of appendages, which later become changed into the two pairs of antennæ and the mandibles of the adult. The first pair of the nauplian appendages are simple and apparently are only sensory, while the two remaining pairs are two-branched, and serve as swimming organs, the basal portions being also used as jaws to force food into the mouth which lies between them. In the higher crustacea two other and better developed larvæ, known as the *zoëa* and the *megalops* may appear.

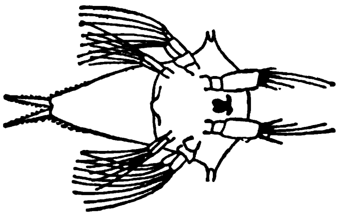


Fig. 3.—Nauplius of Sacculina.

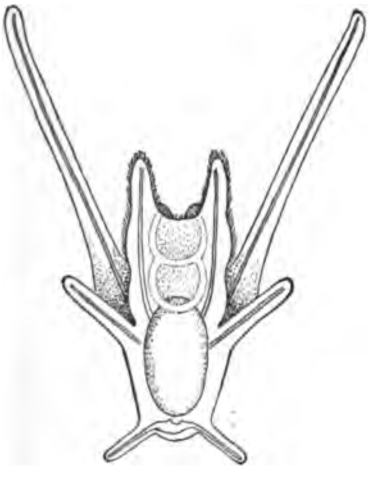


Fig. 4.—Pluteus of a sea-urchin.

Possibly the most remarkable larvæ occur among the echinoderms. These forms, exemplified by the starfish and sea-urchin, are noticeable for their radial symmetry, but in the larvæ, of which there are several distinct types, not a trace of a radial arrangement of parts can be found. They are rather markedly bilaterally symmetrical, with well-marked dorsal and ventral surfaces, which, however, do not correspond with the upper and lower surfaces of the adult. Some of these larvæ are more or less barrel-shaped, but in others, as the *pluteus* (Fig. 4) and *bipinnaria* (Fig. 5), the body is drawn out into a number of processes, soft and flexible in the latter, but stiffened in the pluteus by internal calcareous rods. The starfish or sea-urchin later arises on one side of this larva, the processes are absorbed and the radial arrangement is superimposed upon the bilateral features in the adult, without, however, completely obliterating them.

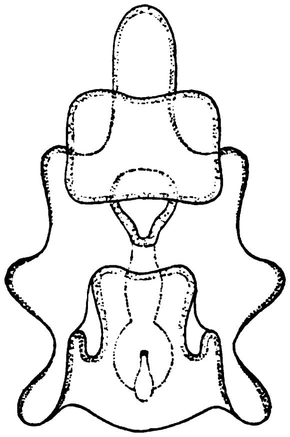


Fig. 5.—Bipinnaria of a starfish.

The larval forms of insects vary greatly both in their form and in the completeness of their metamorphosis. They may be divided into two classes, the cruciform and the campodeaform. The former include those which are worm-like, such as the caterpillars (q.v.) of moths and butterflies, the grubs of beetles, the maggots of flies, and the like. They are the most numerous and conspicuous forms, and are active and voracious, and do nearly all the damage to be attributed to injurious insects. The campodeaform larvæ are those which nearly resemble the parents, such as the nymphs of the dragon-fly and related groups. The second stage of larval life among insects is a very different existence, usually stationary and quiescent, and is called the pupa stage (see Pupa). Some larvæ among insects and elsewhere may breed,—a phase of reproduction called pædogenesis (see Parthenogenesis).

The value of the different forms and habits of life assumed by animals in passing through the larval stage or stages is that it tends to prevent the extinction of the species, since if at any moment all the adults were swept out of existence, the young living in a different station would continue to represent and revive the species. «This law is seen to hold good among the insects,» as Packard points out, «where many species are represented in the winter-time by the egg alone, others by the caterpillar, others by the chrysalis, while still others hibernate as imagoes. Again, in the marine species, the free-swimming young are borne about by the ocean and tidal currents, and in this what in adult life are the most sedentary forms become widely distributed from coast to coast and from sea to sea.» On the other hand, the larval forms of fixed marine animals serve as food for fishes, especially young fishes and numerous invertebrates, which, without this resource, would starve.

Among vertebrates larvæ are rare, and appear only in the lower forms, those of the lamprey (*Ammocœtes*), of eels (*Leptocephali*), of certain salamanders (axolotls), and of frogs (tadpoles), being the most noticeable.

J. S. Kingsley,
Professor of Zoology, Tufts College.

Laryngismus (lăr-ĭn-jĭs'mus) **Strid'ulus.** Laryngismus is spasm of the glottis, causing contraction or closure of the opening; laryngismus stridulus (also called Kopp's asthma, Millar's asthma, etc.), is spasm of the glottis usually associated with some disease, especially with the common ailment of children known as rickets.

Laryngitis, lăr-ĭn-jī'tĭs. See Nose and Throat.

Laryngoscope, lā-rĭng'gō-skōp, an instrument used for examining the larynx. It consists of a little plane mirror attached to a stem, about four inches long, at an angle of 120° or more. This mirror is introduced into the mouth of the person to be examined, and held near the back of the throat, while a strong light is thrown upon it from a reflector worn upon the forehead, or held between the teeth of the examiner. In the strong light of the sun, or of an argand burner, the light thrown from the reflector is concentrated upon the laryngeal mirror, which lights up the parts to be examined, while it at the same time reflects the images of these parts into the eye of the examiner. In this way the mechanism of the human voice may be studied, and what is of considerable importance, disease if present can be readily detected, and the fitting remedy applied. The chief merit of introducing this instrument in a very complete form into medical practice must be assigned to Drs. Turck, of Vienna, and Czermak, of Prague, although Garcia, Liston, Babington, Avery, and others used a reflecting mirror to explore the recesses of the throat. It was not until the two German physiologists took up the subject in 1857 that the benefits arising from its use were fully recognized.

Laryngotomy, lăr-ĭng-gŏt'ō-mĭ. See Bronchotomy.

Lar'ynx, the organ by which the voice is produced, situated at the upper part of the trachea or windpipe. The larynx is formed mainly by two pieces of cartilage, called the thyroid and the cricoid, one placed above the other. The thyroid is formed of two extended wings meeting at the middle line in front of a ridge; above and from the sides two horns project upward, which are connected by bands to the hyoid bone, from which the larynx is suspended. The thyroid cartilage rests and is movable upon the cricoid, moving backward or forward, but not from side to side. The cricoid cartilage is shaped like a signet-ring (Greek *krikos*, a ring), the narrow part of the ring being in front. The cricoid carries, perched on its upper edge behind, the arytenoid cartilages, which are of great importance in the production of the voice. These various cartilages form a framework upon which muscles and mucous membranes are disposed. The mucous membrane which lines the larynx is thrown into various folds. These folds are called the true vocal cords, and by their movements the voice is produced. They are called true, as distinct from the false vocal cords which are above them, but take no part in producing the voice. The true vocal cords projecting toward the middle form a chink, which is called the glottis. By the contraction of various muscles this chink can be so brought together that the air forced through it throws the edges of the membrane into vibration and so produce sounds. Variations in the form of the chink will effect changes in the sound. Thus the production of voice is the same as in musical instruments, the arrangements in the larynx being such as to produce (1) the vibratory sounds, (2) to regulate the sound, (3) to vary the pitch, and (4) to determine the quality of the sound. The rapid, delicate muscular movements involved are produced by nervous stimulii reaching the muscles from the brain. Thus the voice is produced in the larynx, and is modified by the rest of the respiratory passages. (See Voice.) In the act of swallowing, the glottis is covered by a cartilaginous plate called the epiglottis. In the accompanying cut, Fig. 1, shows c, the larynx internally, b being the epiglottis situated above the glottis or entrance to the larynx, a a the trachea, and d the œsophagus or gullet. In Fig. 2, j is the trachea, b the hyoid bone, n n the thyreo-hyoid membrane, o the thyreo-hyoid ligament, g the thyreoid cartilage, h the cricoid cartilage, p the crico-thyreoid ligament. See Nose and Throat.

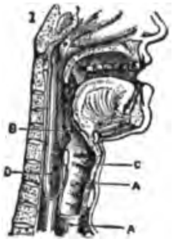


Fig. 1.
Larynx internally.

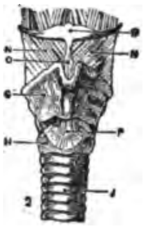


Fig. 2.
Larynx externally.

La Salle, Jean Baptiste de, zhŏṅ băp-tēst dē lä säl, French priest and educator, called the father of modern pedagogy: b. Rheims 30 April 1651; d. Saint-Yon 7 April 1719. After completing the preparatory course of humanities, he entered the university of his native city where, at the age of 19, he took his Master's degree. Shortly afterward he went to the Seminary of Saint Sulpice at Paris; and, while living there, followed the theological courses of the Sorbonne. On Easter eve 1678, he was ordained priest, being already a titular canon of the Cathedral Church of Rheims; two years later, in 1681, after defending a thesis before the faculty of the University of Rheims he obtained the degree of Doctor in Sacred Theology.

A man of means and academic culture, he was also a friend of the people, a true philanthropist, giving away all his patrimony in alms to help the deserving poor. He interested himself at an early period in education, especially the education of children belonging to the humbler classes. He noticed that nowhere was there a clear distinction drawn between primary and secondary education and that nowhere was there any provision made for instructing school-children in subjects of acknowledged utility to them in after life.

To correct this state of affairs he founded in 1681 a society of teachers under the name of Brothers of the Christian Schools (q.v.), enjoining them by rule to take the vows of religion but not to enter holy orders. By this latter regulation, he sought to free them from ecclesiastical duties so that they might be able to devote themselves unreservedly to the work of education. The rules and constitutions of the society were approved in 1724 by Pope Benedict XIII.

The first great change introduced by De la Salle and successfully carried out by his followers was the substitution of French for Latin as the language of the class-room. As in the case of antecedent reforms, this roused a swarm of wrathful critics; but it soon met with the approval of the universities and highest authorities in church and state.

The individual system of teaching was then in vogue, and as it seemed to him to involve loss of time and to favor idleness, he replaced it by the «simultaneous» method in which the teacher addresses himself to a numerous division and frequently to a whole class at a time. He insisted on the Socratic method of teaching for all subjects, rejecting the lecturing style as unsuited to elementary instruction. He also recommended the frequent use of object-lessons. Such thorough-going changes gave a great impetus to education inasmuch as it increased the efficiency of the teacher while diminishing his drudgery, and insuring substantial results. In due time, these bold innovations in educational methods brought about a general system of popular education in France as well as in other European countries, and merited for their author the title of Father of Modern Pedagogy.

In 1684 he opened a *Seminaire de Maîtres d'Ecole* for the formation of competent masters for the rural districts, which seminary was the first normal school or training college founded in Europe. Admission was by examination; and during the course, opportunities were afforded for practice-work by the free schools attached to the institution. In his endeavors to instruct the masses and educate the people, De la Salle established in Paris in 1699 regular public courses in science and art in which instruction was given to all comers on Sunday from 12 to 3, the session being always concluded by a short religious instruction. These schools were called *Ecoles Dominicales* and were, in some respects, the prototype of our Sunday schools. At Saint-Yon, near Rouen, he also founded a school of higher studies in which the students were allowed to select the courses best adapted to their wants.

De la Salle lived to see his society firmly established in France and his educational work appreciated at home and abroad. Among his published writings are *Le Devoir du Chrétien* and *La Conduite des Ecoles;* others are of an ascetical character and refer to the religious life.

This great educator and benefactor of the people was of a gentle yet firm disposition; severe to himself but kind and encouraging to others. The holiness of his life was proclaimed to the world by Pope Leo XIII. who on 24 May 1900, conferred on him the honors of canonization and enrolled him among the saints of the Catholic Church. BROTHER POTAMIAN,
Manhattan College, New York.

La Salle, René Robert Cavalier, ré-nā rō-bār kä-vā-lē-ā, SIEUR DE, French explorer: b. Rouen, France, 22 Nov. 1643; d. Texas 20 March 1687. He sailed for Canada in 1667 with the hope of making his fortune there; became a fur trader at La Chine (so named for its supposed position on the route to China), explored Lake Ontario, established forts on the St. Lawrence, and was made by Frontenac commander of a fort which stood where Kingston, Ontario, now stands. Returning to France he received large grants of land in Canada, and was ennobled, but on the discovery by Marquette of the Mississippi, he left his new estate to seek the mouth of the great stream. His designs were favored by the French minister of marine, who supplied him with men and ships. In 1679 he had built and launched on the Niagara River a bark of 60 tons, the Griffin, crossed Lake Erie, and Lake St. Clair, and reached Green Bay. Here he loaded the Griffin with rich furs and sent it to meet the claims of his creditors at Montreal. He then proceeded in bark canoes and reached the banks of Lake Peoria. Leaving his lieutenants to continue explorations he returned to Fort Frontenac, where he learned of the wreck of the Griffin, and another ship sent with supplies for him from France. In the meantime his little band of explorers had been scattered through dissensions, but he succeeded in gathering them and descended to the mouth of the Mississippi, where he built a fort, and named the adjacent lands Louisiana. This was the great achievement of his life. After a visit to France he failed on his return (1684) with 4 vessels and 280 men, to locate the mouth of the Mississippi. He had a difference on this point with Beaujeu, the naval commander, who persisted in sailing on to Matagorda Bay. Here La Salle, to avoid further quarrels and recriminations, abandoned his companions; the colonists who followed him lost most of their supplies in a gale of wind, but managed to fortify the fort of St. Louis; they failed in their agricultural attempts, and sought in vain for gold. Their numbers were reduced to 35, and in 1687 he set out for a return to Canada. Two men, Dubant and L'Archevêque, who had embarked capital in the enterprise, were incensed at its failure, and in a quarrel murdered the nephew of La Salle, who, when he enquired into the matter, was shot dead from ambush.

Lasalle, lạ-săl', Ill., city in Lasalle County, on the Illinois River, the Illinois & Michigan Canal, and on the Illinois C. and the Chicago, R. I. and Pacific R.R.'s; 99 miles southwest of Chicago. It is the centre of a large trade by river, canal, and rail; is in a rich bituminous coal region; and is engaged in coal mining, zinc smelting and the manufacture of sulphuric acid, hydraulic cement, sewer pipe, bottles, clocks and ornamental pressed brick, and common brick. It is the seat of Saint Bede College and Saint Mary's Hospital; has a public library;

good sewerage system, waterworks, hospitals, a National bank, electric light and street railroad plants, and daily and weekly newspapers. The city was settled in 1830, and named in honor of La Salle, the explorer. It was chartered in 1852. The government is vested in a mayor and council. The city owns and controls the electric light plant and waterworks. Pop. (1890) 9,855; (1900) 10,446.

La Salle College, an educational institution in Philadelphia, Pa., founded in 1867 under the auspices of the Roman Catholic Church. It is under the management of the Brothers of the Christian Schools. In 1903 there were 24 instructors, 276 students, 8,700 volumes in the library, and the grounds and buildings were valued at $250,000.

Lascar, lăs-kär', a name generally applied to Indian sailors on board of British ships, as, for instance, the large steamers of the Peninsular and Oriental Company. The Lascars make good seamen, being both temperate and docile. They are mostly Mohammedans.

Las Casas. See CASAS, BARTOLOMÉ DE LAS.

Las Cases, Emmanuel Augustin Dieudonné Marin Joseph, ĕm-măn-oo-ĕl ō-güs-tăṅ dē-ė-dŏn-nā mä-răṅ zhō-zĕf läs käs, French historian; one of the companions of Napoleon at St. Helena: b. Chateau Las Cases, near Revel, 1766; d. Passy-sur-Seine 15 May 1842. He was educated at the school of the Oratorians in Vendôme, and at the military and naval schools of Paris, and when the Revolution broke out took part with the royalists. After the defeat of the Prussians in Champagne he fled to London, where he lived as a teacher. While here he executed his 'Atlas historique et géographique' (1802), which he published under the name of Le Sage. When the *émigrés* were recalled by Napoleon, Las Cases returned to Paris. Having entered the army of Bernadotte (1809) he gained the favor of Napoleon, who in 1810 made him chamberlain and count of the empire. After the disasters of Leipsic and Moscow, Las Cases commanded the 10th legion of the national guard. In 1814 he refused to assent to the request for Napoleon's abdication, and went to England, whence he subsequently sent in his adhesion to the Bourbons. After the return from Elba he went back to France, and after the final defeat of the emperor at Waterloo followed him to St. Helena. Here with his son he devoted himself to the care of Napoleon, and passed his evenings in recording the emperor's remarks, which were subsequently published in his 'Mémorial de Sainte Hélène, ou Journal ou se trouve consigné, jour par jour, ce qui a dit et fait Napoléon pendant dix-huit Mois' (1822-3). Having written a letter to Lucien Bonaparte commenting freely on the treatment to which Napoleon was subjected, he was arrested, 25 Nov. 1816, sent to the Cape of Good Hope, presently taken to England, thence conveyed to the continent, and to Frankfort-on-the-Main, where he at last received his liberty after 13 months' captivity. He was not allowed to return to France until the death of Napoleon. In the reign of Louis Philippe he was elected in 1831 and 1839 to the chamber of deputies, taking his seat at the extreme left, or with the ultra opposition. He wrote, in addition to the works above mentioned, his own life, 'Mémoires d'E. A. D., Comte de Las Cases, communiqués par lui-même' (1819).

La Serena, lä sā-rā'nä, Chile, city, and capital of the department of Coquimbo (q.v.), on the Pacific coast, 215 miles north of Valparaiso. A railroad connects it with Coquimbo, 8 miles distant. Pop. (1900) 16,561.

Lasker, läs'kĕr, **Eduard,** German politician: b. Jarotschin, Posen, 14 Oct. 1829; d. New York 5 Jan. 1884. He was of Jewish descent, and after being educated at the Universities of Breslau and Berlin obtained a post in the municipal court (1851). He spent three years in England. On his return he entered the government service and was elected in 1865 to the Lower House. He sat subsequently in the Constituent North German Diet, and up to the time of his death in the North German and German Diet for the district of Saxe-Meiningen. He was associated with the «Fortschrittspartei» or Progressives, and in 1866 assisted in forming the National Liberal Party. He took an active part in the civil consolidation of the German empire. Among his writings is: 'Zur Verfassungsgeschichte Preussens' (1874).

Lasker, Emanuel, German chess champion: b. Berlinchen 24 Dec. 1868. He chose mathematics as a profession, but eventually turned his attention to chess, playing with such success that since 1892 he has triumphed over all competitors both in tournaments and duel matches. He has outplayed, without losing a single game, Blackburne, Bird and F. Mieses of Leipsic. In 1892 he won the first prize in the London tournament; and in the International tournament at New York in 1893 beat all the best players, including Steinitz, champion of the world. A decisive match was arranged between him and Steinitz at Moscow and came off December 1896 and January 1897. Lasker won by 10 games to 2, 5 being drawn.

Las Palmas, läs päl'mäs, Canárias, the chief town of Grand Canary Island, and seat of the provincial government: an attractive place, with clean streets, a few handsome public buildings and churches, shaded walks, a well-defended small harbor, and a somewhat inadequate water-supply. The principal industries are the building and repairing of vessels, and manufacturing woolen goods, hats, leather, and glass. Population about 12,000.

Lassa, läs'sä. See LHASA.

Lassalle, lä-säl', **Ferdinand,** German Socialist: b. Breslau 11 April 1825; d. Geneva 28 Aug. 1864. He studied at the universities of Breslau and Berlin, and while there gained the friendship of such men as Böckh and Humboldt. Toward the end of 1844 he met at Berlin the Countess Hatzfeldt, who had contracted an unfortunate marriage, conducted her suit for separation, and brought it to a successful issue. He first made himself known as a leader during the democratic troubles of 1848, and was imprisoned for a year for alleged inciting to revolt. In 1858 he produced a work on the philosophy of Heraclitus, and in 1861 published his 'System of Acquired Rights.' Thereafter he proceeded to organize the working-classes, which caused the government to accuse him of sedition, and he was imprisoned for four months. He was at first allied with the party of the Progressists, but in 1862 he broke with them; in 1863 he issued his famous 'Offenes Antwortschreiben,' a brochure in which he sets forth his working-class programme; and later in the same year founded a Labor Union (Allgemeiner deutscher Arbeiterverein), and began the Socialist propaganda in Germany. In 1864 he published an attack on the Manchester school of economists under the title 'Herr Bastiat-Schultze von Delitzsch der ökonomische Julian, oder Kapital und Arbeit.' In the summer of the same year he was killed in a duel occasioned by a love affair. One of the chief points in his economic theory was that the "iron law of wages" tended always to reduce wages to the mere cost of living; to remedy this he proposed associations of the working classes in productive enterprises with capital furnished by the state. He left no such elaborate statement of his views of the nature of capital and capitalistic society as did Marx; nor did he influence the labor movement so much through his theoretical teachings as through his power and success as an organizer. Consult: Bernstein, 'Lassalle as a Social Reformer'; and Dawson, 'German Socialism and Lassalle.'

Lassell, lạ-sĕl', **William,** English astronomer: b. Lancashire 18 June 1799; d. 5 Oct. 1880. His early education was scanty, and while serving a mercantile apprenticeship at Liverpool he made telescopes for himself, and in a private observatory which he built near that city he began his astronomical work, about 1820, and continued it until 1861. There he built and mounted reflecting telescopes equatorially, the first of the kind in use, and also invented a method of polishing the specula. With his own telescope he discovered the satellite of Neptune in 1847, observed the eighth satellite of Saturn in 1848, and in 1851 discovered two new satellites of Uranus. In 1861, at Valetta, on the island of Malta, he mounted equatorially a reflecting telescope, and at that place until 1865 he made observations, also describing new nebulæ and correcting many of his former results. In 1865 he returned to England, built an observatory near Maidenhead, and there spent the remainder of his life.

Lassen, läs'sĕn, **Christian,** Norwegian philologist and linguist: b. Bergen, Norway, 22 Oct. 1800; d. Bonn, Prussia, 8 May 1876. He studied at Christiania, Heidelberg, and Bonn, at which latter university he became in 1830 extraordinary and in 1849 ordinary professor. With Eugène Burnouf he deciphered many Pali MSS., and the result of their labors was published by the Asiatic Society in an 'Essay on the Pali or Sacred Language from the Peninsula beyond the Ganges.' He published with Schlegel the 'Ramayana' and the 'Hitopadesa,' and was for many years editor of the 'Zeitschrift für die Kunde des Morgenlandes.' His works, which are numerous and valuable, relate to a variety of oriental languages and ancient history, embracing, among other subjects, translations from the Hindu philosophy, the history of Bactriana, Cabool, and India, and cuneiform inscriptions.

Lassen, Eduard, Danish composer: b. Copenhagen 13 April 1830; d. Weimar 15 Jan. 1904. He began his education at Brussels and 1851 won the "Prix de Rome." Through Liszt his opera 'Landgraf Ludwigs Brautfahrt' was produced in Weimar (1875), where he was made the following year "Kapellmeister" to the court. He retired in 1895. Of his compositions those which are most remarkable for talent and artistic sincerity are the operas: 'Frauenlob' (1860); 'Le Captif' (1868). He wrote two symphonies, and the music for Sophocles' 'Œdipus,' and Goethe's 'Faust,' as well as numerous songs, etc.

Las'so, a long strong thong of buffalo-hide, rope, or leather, with a running noose at one end, used by ranchmen and hunters. It is thrown in such a way as to fall over the horns or head of the animal, the hunter coiling one end round a high pommel on his saddle. When he makes a successful cast the hunter spurs his horse to its fullest speed, and the horse or other animal is almost strangled or borne to the ground, and becomes an easy prey. Instead of a noose a leaden ball may be attached to the end of the thong, which is thrown so as to entangle the legs, neck, or horns of the animal to be captured. The lasso has been used in the South American wars: it was employed against the French sentinels by some of the semi-barbarous tribes whom Russia had pressed into her armies during the Crimean war.

Lasso-cells, or **Stinging Cells,** names applied to the cnidocysts of cœlenterates. See Nematocyst.

Lassus, lás'ŭs, **Orlandus,** or **Lasso,** läs'sō, **Orlando** (originally Roland Delattre), German composer: b. Mons in Hainaut 1520 or 1530; d. Munich June 1594. As a composer he was excelled only by Palestrina among musicians of the 16th century. About 1556 he went to Munich as chapel-master to Albert, duke of Bavaria, and in 1562 became chapel-master, an office which he held till his death. Among his more than 2,000 works are some 60 masses, many madrigals and songs, and the celebrated music for the Seven Penitential Psalms. In the royal library at Munich is the richest collection of his works. His sons published a collection of his motets, entitled 'Magnum Opus Musicum' (1604, 17 vols. folio). An edition of his collected works appeared at Leipsic 1893 (et seq.).

Last Days of Pompeii, The, a celebrated romance, by Edward Bulwer, Lord Lytton, published in 1834. The characters and scenes are suggested by the peculiarities of the buildings at Pompeii. Beginning a few days before the destruction of Pompeii, the story relates principally to two young Greeks, Glaucus and Ione, who are deeply attached to each other. The former is a handsome young Athenian, impetuous, high-minded and brilliant, while Ione is a pure and lofty-minded woman. Arbaces, her guardian, is the villain, who, under a cloak of sanctity and religion, indulges in low and criminal designs. His character is strongly drawn; and his passion for Ione, and the struggle between him and Glaucus, form the chief part of the plot. Nydia, the blind girl, who pines in unrequited affection for Glaucus, and who saves the lives of the lovers at the time of the destruction of the city, by conducting them in safety to the sea, is a touching and beautiful conception. The book, full of learning and spirit, is not only a charming novel, but contains many minute and interesting descriptions of ancient customs.

Last of the Mohicans, The, an American novel by James Fenimore Cooper, published in 1826. It formed one of the celebrated Leatherstocking tales.

Last Rose of Summer, The, a famous song by Thomas Moore, published in his 'Irish Melodies.' The air was derived from an old melody, 'The Groves of Blarney.'

Last Sigh of the Moor, The, a large hill in the outskirts of the city of Granada, Spain. It is noted as the spot where Boabdil, the last Moorish monarch, took his farewell of the land of his birth, 2 Jan. 1492.

Las Vegas, läs vä'gäs, N. Mex., city and county-seat of San Miguel County; on the Gallivar River, a branch of the Pecos, and on the Atchison, T. & S. Fe railroad, 83 miles east of Santa Fe. There are here practically two towns, the old Mexican settlement, which is the county-seat, and the modern city lying to the east, first known as East Las Vegas, but incorporated in 1896 as the city of Las Vegas. The New Mexico Normal University is located here, and there is a public library, flour-mills, carriage and wagon shops, railroad machine shops, planing-mills, foundries and machine shop. The surrounding country is devoted to agriculture and stock raising and Las Vegas is an important wool market. The health resort known as Las Vegas Hot Springs is located 6 miles distant, at an elevation of 6,767 feet above the sea. Pop. (1901) 8,000.

Laszow'ski-Ger'ard, MADAME **Emily de,** Anglo-Austrian novelist: b. Scotland 7 May 1849. She was educated in the Convent of Riedenburg in the Tyrol, was married to the Chevalier Miecislas de Laszowski, an Austrian lieutenant-general, and resides in Vienna. She published: 'Reata' (1880); 'Beggar My Neighbor' (1882), and other novels, written in collaboration with her sister, Dorothea Gerard, and 'Bis' (1890); 'The Tragedy of a Nose' (1898); 'The Extermination of Love' (1901); and other novels of which she is sole author. Her fiction has been popular both in England and America.

Latacunga, lä-tä-koon'gä, Ecuador, capital of the province of Leon and one of the oldest towns in the republic, containing an administration building, city hall, college, hospital, school for young ladies, five churches, two printing houses, manufactories of woolen and cotton fabrics, potteries, etc. Owing to its situation on a plain more than 9,000 feet above sea-level, it has an even and temperate climate, and the surrounding country is well adapted to agriculture and cattle-raising; but it is only 25 miles distant from the great volcano, Cotopaxi, and has repeatedly been destroyed by earthquakes. Pop. about 12,000.

Latchaw, John Roland Harris, American educator: b. Venango County, Pa., 7 Sept. 1851. He was graduated at Hillsdale College in 1881 and in 1895-6 studied at the University of Chicago. In 1881 he founded Barkeyville Academy in Pennsylvania, and conducted it until 1884, when he became president of Findlay College, where he was also lecturer on psychology and theology till 1893. From 1893 to 1895 he was minister of the First Baptist Church at Zanesville, Ohio; held several other pastorates; was president of Defiance College, 1896-1902, since when he has been president of Palmer University. He has written: 'Outlines of Psychology, Its Method and Matter'; 'Citizenship in the Northwest Territory'; 'Outline Lectures in Theology'; 'Theory and Art of Teaching'; and is editor and publisher of the 'Truth Seeker' and joint editor of 'Unity Herald.'

Lateral Line Organs, a system of sense organs in the lower aquatic vertebrates, so called from the fact that part of the system makes a well marked line on the side of the body of fishes, although a larger but less conspicuous portion of the organs occurs upon the head. In their simplest form, as in the fish *Chimæra,* the organs are placed in grooves, but usually the grooves are closed into tubes with openings at regular intervals by which water obtains access to the canals. The distribution varies considerably in different fishes, but the most constant canals are one along the side of the body, one across the back of the head, and three rows, one above, one below the eye and one on the lower jaw. The sense-organs contained in the canals belong to a group of peculiar structures known as «nerve-hillocks» or «neuro-masts,» and are further peculiar in their nerve supply, which is derived from the 7th (facial) and 10th (vagus) nerves. In the case of the amphibia these organs occur only in the aquatic forms. Hence, while they are present in tadpoles, they are lost, and with them their nerves, when the tadpole changes into a frog or toad. This would indicate that their function is in some way connected with an aquatic life, and only very recently has it been shown to be for the recognition of vibrations of low rapidity in the water. There has been accumulated considerable evidence to show that the ears of vertebrates are only specially modified parts of the lateral line system.

J. S. KINGSLEY,
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Lat'eran, palace and church at Rome. The name is derived from Plautius Lateranus, head of a rich patrician family whose estates were confiscated by Nero, while he himself was put to death for complicity in the conspiracy of Piso. The palace afterward became an imperial residence, but was given to Pope Melchiades in 312 by Constantine the Great, and became the residence of the popes for a thousand years. Only one fragment of the palace of Constantine remains, the private chapel of the popes, and the end wall of their dining-room. The rest is all recent, the old palace having been rebuilt from designs of Fontana by Sixtus V. In 1438 Gregory XVI. turned it into a museum, and it contains many fine pictures and statues, and mosaics, notably the flooring taken from the baths of Caracalla in 1822 and containing 28 portraits of gladiators. The basilica of St. John Lateran is the original see church of the bishop of Rome. The see church was built by Pope Sylvester, Constantine joining with his own hands in the construction. It was consecrated in 324, overthrown by an earthquake in 896, rebuilt by Sergius III. in 911. This second basilica was destroyed by fire in 1308 and again after rebuilding in 1360, but restored by Urban V. 1370. The church consists of five naves. The transept is the most beautiful part of the building, and the many colored marbles, the statues of the Apostles, the Tabernacle, beneath which the skulls of Saints Peter and Paul are said to be preserved, the grand mosaic of the Head of Christ above the arch of the tribune (a work of art attributed to the time of Constantine), are all notable features among the numberless examples of religious art to be found in the building.

Lateran Councils, five councils of the Roman Catholic Church, held in the Church of St. John Lateran, Rome, under the presidency of the pope. The first Lateran Council took place in 1123, under Calixtus II. The Concordat of Worms was confirmed, the indulgences granted to the crusaders by Urban II. were renewed; the consecrations performed by Burdin, the antipope, were annulled; the decrees against simony, marriage of the clergy, etc., were repeated. The second (1139), under Innocent II., laid the interdict upon King Roger of Sicily, excommunicated the Petrobrusians, and ordered Arnold of Brescia to keep silent. The third (1179), under Alexander III., decreed that a vote of two thirds of the total conclave should be required legitimately to elect a pope. The fourth, conveyed by Innocent III. in 1215, is the most important of all the Lateran Councils. Besides representatives of many princes, two Oriental patriarchs were present 412 bishops, and 800 abbots and priors. Seventy decrees were issued. The first, directed against the Cathari and Waldensians, contains a confession of faith, in which the term *transsubstantiatio* occurs for the first time. The second decides the Trinitarian controversy between Petrus Lombardus and Joachim of Floris (in favor of the former). The 13th forbids the foundation of new monastical orders. The 21st decrees that all the faithful shall confess at least once a year to his sacerdos proprius (Mansi xxii. 953–1086. The fifth (1512–17), which was not recognized by the Gallican Church, abrogated, on the command of Julius II., the Pragmatic Sanction issued by the Council of Pisa, and approved the concordat between Francis I. of France and the pope by which the «liberties» of the Gallican Church were abrogated.

Consult: Valentini, ‘Basilica Lateranense descritta ed illustrata’ (1839); Buddeus, ‘De Conciliis Lateranensibus,’ Jena (1725).

Lat'erite, a highly ferruginous, argillaceous rock, found in India. The laterite of the highlands results from the weathering of the underlying volcanic rocks. «Low-level laterite» is the surface-rock of the extensive low lands near the western coast; is formed from the debris of volcanic rocks of the region and of highland rocks.

Latham, lā'tham, **Robert Gordon,** English ethnologist and philologist: b. Billingsborough, Lincolnshire, 24 March 1812; d. Putney, Surrey, 9 March 1888. He was educated at Eton and Cambridge and became professor of English literature in University College, London. He published numerous works on the English tongue, among them a ‘Treatise on the English Language’ (1841; frequently republished); ‘History and Etymology of the English Language’ (1849); ‘Handbook of the English Language’ (1851); ‘Elements of Comparative Philology’ (1862). His principal works on ethnology are: ‘Natural History of the Varieties of Man’ (1850); ‘Man and his Migrations’ (1851); ‘Ethnology of the British Islands’ (1852); ‘Ethnology of Europe’ (1852); ‘Descriptive Ethnology’ (1859); ‘Russian and Turk’ (1878).

Lath'bury, Mary Artemisia, American author and illustrator: b. Manchester, N. Y., 10 Aug. 1841. She was educated at Manchester and at Worcester, Mass.; after leaving school engaged in teaching art, and subsequently in editorial work; and since 1876 has devoted herself to general literature and illustration. She is author and illustrator of ‘Fleda and the Voice’ (1878); ‘Out of Darkness into Light’ (1880); ‘Seven Little Maids’ (1882); ‘Ring-Around-a-Rosy’ (1884); ‘Idyls of the Months’ (1884); ‘Twelve Times One’ (1885); ‘From Meadow Sweet to Mistletoe’ (1888); ‘Child's Story of the Bible’ (1898); has also published other books, and is well known through her Chautauqua songs and hymns in church collections.

Lathrop, lā'thrŏp, **George Parsons,** American author: b. Oahu, Sandwich Islands, 25 Aug. 1851; d. New York 19 April 1898. He was educated in New York and in Dresden, studying in the latter city from 1867 to 1870, when he returned to New York and for a short time studied law. He went to England and there, in 1871, married Rose, second daughter of Nathaniel Hawthorne. (See LATHROP, ROSE HAWTHORNE.) From 1875 to 1877 he was assistant editor of the ‘Atlantic Monthly’; editor of the Boston *Courier* till 1879; resided afterward at Concord, Mass., and in New York city. Among his writings in prose and verse the following are best known: ‘Rose and Roof-Tree,’ poems (1875); ‘Study of Hawthorne’ (1876); ‘Afterglow,’ a novel (1876); ‘A Masque of Poets’ (1877); ‘An Echo of Passion’ (1882); ‘In the Distance’ (1882); ‘Spanish Vistas’ (1883); ‘History of the Union League in Philadelphia’ (1883); ‘Newport’ (1884); ‘Gettysburg, a Battle Ode’ (1888); ‘Dreams and Days,’ verses (1892); ‘Gold of Pleasure’ (1892). With his wife he published ‘Annals of Georgetown Convent’ and ‘A Story of Courage’ (1894); and he brought out an edition of Hawthorne's works, with a biography (1883). The American Copyright League was founded (1883) by Lathrop.

Lathrop, John (also **Lathropp, Laythrop**), American clergyman: b. Yorkshire, England; d. 1653. He was educated at Oxford, took holy orders; was rector at Egerton in Kent; and about the year 1624, in London, became minister (succeeding Henry Jacob) of the first Independent and Congregational church organized in England. He and his congregation underwent annoyance and persecution at the hands of churchmen, and for a time (1632–4) Lathrop was imprisoned. During his confinement he was bereft by the death of his wife and by a division in his flock over a question of baptism, and in 1634 sailed to Massachusetts, where he settled as minister at Scituate, removing in 1639 to Barnstable. The records of these towns kept in «an original register» written by him are referred to as authority by Prince in his ‘Annals of New England.’

Lathrop, John Hiram, American educator: b. Sherburne, N. Y., 22 Jan. 1799; d. Columbia, Mo., 2 Aug. 1866. He was graduated at Yale in 1819, from 1822 to 1826 was tutor there; adopted the profession of law, which he followed for six years, then abandoned it for that of teaching. He taught at Norwich, Vt., and at Gardiner, Maine. Between 1829 and 1840 held professorships of mathematics, natural philosophy, law, history, and economics at Hamilton College; was president of the University of Missouri 1840–9; afterward became chancellor of the University of Wisconsin (1849–59); president of Indiana University (1859–60); professor of English literature at the University of Missouri (1860–2). He was again president of the University of Missouri in 1865, and until the time of his death.

Lathrop, Rose Hawthorne, American author: b. Lenox, Mass., 20 May 1851. She was educated in the public schools, having lived during the years 1853–60 in England, where her father, Nathaniel Hawthorne (q.v.), was United States consul at Liverpool (1853–7), and in Portugal; studied art in Dresden and London; and in 1871 married George Parsons Lathrop, with whom, until his death, she was associated in literary labors. She has been especially interested in the improvement of conditions for suffering and needy people, and in 1891 established Saint Rose's Free Home for Cancer, and Rosary Hill Home, in New York, where she afterward became head of a Dominican community of the Third Order and directress of a charitable home, her title being Mother Mary Alphonsa. Besides many sketches and stories, her writings include 'Along the Shore,' poems (1888), and 'Memories of Hawthorne,' with her husband (1897), with whom she also collaborated in other works. See LATHROP, GEORGE PARSONS.

Lath'yrus, a genus of plants of the pea family, the vetchlings or everlasting peas, which resembles *Vicia* but have fewer leaflets (usually two), broader petals, an obliquely truncate staminal tube, and a style longitudinally flattened and bearded on the inner face. The species are numerous and grow in sandy and waste places, or in meadows. *L. pratensis*, the meadow vetchling, a climbing plant, two or three feet long, with yellow flowers, is a familiar example throughout the whole northern hemisphere. Another species (*L. maritimus*) the beach-pea, is equally widespread. The roots of *L. tuberosus* are eatable. *L. sativus* and other species are used as green fodder for cattle in India, but are harmful to pigs; and several species contain a poisonous principle injurious to the human system. Nearly 60 species of the genus are cultivated for their handsome flowers — yellow, red, scarlet, purple, and blue. The larger kinds are well adapted for arbors and shrubberies, where they may climb upon some support.

Lat'imer, Hugh, English prelate, reformer and martyr: b. Thurcaston, Leicestershire, about 1490; d. Oxford 16 Oct. 1555. He was educated at Cambridge, took holy orders, and by and by began to preach Protestant doctrine, which led to vigorous opposition. He was made chaplain to Henry VIII. in 1530, and during the ascendency of Anne Boleyn in 1535 was appointed bishop of Worcester. In 1538 he resigned his bishopric, not being able to accept the Six Articles, and was put in prison, but on the accession of Edward VI. he was released and became highly popular at court. This continued until Mary ascended the throne, when Latimer was cited to appear, with Cranmer and Ridley, before a council at Oxford, and condemned. After much delay and a second trial, Latimer and Ridley were burned at the stake. His preaching was popular in his own time for its pith, simplicity, and quaintness, and his 'Sermons' are still read. Consult Lives by Demaus (1869); R. M. Carlyle (1890).

Latimer, Mary Elizabeth Wormeley, American author: b. London, England, 26 July 1822. She was privately educated and wrote largely for the press. Among her works are: 'Salvage'; 'Princess Amélie'; 'A Chain of Errors'; 'My Scrap-Book of the French Revolution' (1898); 'The Last Years of the XIXth Century' (1901); 'The Prince Incognito' (1902); and 'Talks of Napoleon at St. Helena with General Gourzand' (1903).

Latin America, a general name given to the countries and people in South and Central America; especially those races who come of Latin stock. These include naturally the Mexicans, the inhabitants of Central America and certain islands of the West Indies.

Latin-American Literature. The Rio Bravo del Norte, or Rio Grande, serves as a dividing line between what may be termed "Saxon America" and "Latin America." We of Saxon America are apt to look complacently upon ourselves as considerably in advance of our neighbors to the south, at least in material prosperity. But consider a moment the difference of circumstances under which we have grown. From the discovery of Haiti to the founding of Jamestown was 125 years; to the landing of the Pilgrims, 138. During those years Europe had been growing — England and Holland quite vigorously. The priority of Spain and Portugal was therefore a disadvantage: they reached the Western hemisphere in their intellectual infancy; England in her rough, growing youth.

The American possessions of Spain and Portugal were practically twice as remote as those of England. The English colonists kept close to the eastern edge of the continent, and to navigable waters; the most important settlements in Latin America were far inland, and could communicate with the outer world only by means of pack-mules. The maritime districts of the tropical regions were scarcely habitable by Europeans; and when the colonists moved into the interior, it was to be shaken by earthquakes, or terrified by the blaze of volcanoes. As the quest for gold was the chief motive with the Spaniards, they clustered around the old seats of aboriginal civilization, — the plateau of Mexico, Cundinamarca, Quito, and Lima. Subsequently communities of Europeans were established at Caracas, Santiago de Chile, the mouth of the Plata, and at various points along the Brazilian coast; but these did not attain prominence as literary centres until far into the 18th century. In the mean time, the intervening portions of the continent were pathless expanses of prairie and forest traversed by mighty rivers and lofty mountain ranges.

In the matter of acquiring and settling the new continent, the Church naturally took an active part. In addition to the bishops and the parochial clergy, whose duty was to provide for the spiritual needs of the European settlers, large numbers of the monastic orders were assigned to the conversion of the natives. By far the most important of these religious bodies was the Society of Jesus, whose members are popularly known as Jesuits. They were the latest in making their appearance; but their great organizing ability enabled them to outstrip all the rest. It was not long before they had gathered tribes of wandering savages into civilized communities, and they established great cattle ranches and sheep farms, together with mills, workshops, warehouses, and routes of trade. Paraguay became in effect a Jesuit state, until its prosperity and the mistaken notion that there were rich gold mines within its limits raised combinations hostile to the order. The Inquisition was introduced in 1569. It had not only the oversight of faith and morals, but also the control of education and of the admission of books into the country. Such instruction as the «Holy Office» was willing to sanction was with scarcely an exception imparted by members of the monastic orders. The *frailes* in their monasteries taught gratuitously the elementary branches and the prayers of the Church; but these slender advantages were available only in the towns. Boys might also be taught writing and the four operations of arithmetic. As to the girls, they were taught by the nuns reading, prayers, and the use of the needle; a few added music and painting. Aristides Rojas, the Venezuelan historian, has related how the first municipal school was established in Caracas. It was 24 years after the founding of the city, and it required a mission to Spain and two years of lobbying to obtain the royal permission to have a school at all; and its field of usefulness was at first limited to Spanish grammar and rhetoric. Books could be imported only on permits, obtainable with difficulty, after close scrutiny and long delay. An equally strict surveillance was exercised over colonial literary productions; each volume of each edition had to be registered separately, after donating 20 copies to the legal and regal authorities; and the publisher had not even the privilege of fixing the price.

The Colonial Period.— It was in such arid and sulphurous soil as has been described that Latin-American literature had to germinate. The first cultivators had to overcome difficulties unknown to those of happier countries; and it is with a feeling of wonder mixed with reverence that we realize how patiently and successfully they did overcome them. Learning made its first appearance — where alone it could — among the monks. As their special mission was to convert the Indians, they diligently studied Indian languages, customs, and antiquities; and it is to the diligence of these men that ethnologists owe nearly all that is known of the ancient civilizations of Mexico, Peru, and Cundinamarca. Botany and vegetable pharmacy afforded another appropriate field; and the various colonial governments fitted out at different times as many as five botanical expeditions. The students of the mathematics found exercise in geodetic surveys; and a knowledge of mechanics was essential in the working of the mines. Clavijero furnishes a long list of those who had made translations into the native tongues. All with one or two exceptions belonged to the monastic orders; and their studies embraced 15 languages. Humboldt himself saw dictionaries and grammars of 14. Quesada says that printing was introduced into Mexico in 1535, and into Lima in 1538; and that the first books printed in America were for the use of the Indians. In the remainder of the century there were written or printed 82 books for the religious instruction of the aborigines in Mexico, and 50 for learning the native languages.

In time higher schools, colleges, and universities were established in the principal colonies,— the instructors being, with scarcely an exception, ecclesiastics. The little Jesuit college of Bahia began its dubious existence in 1543, and another and larger one was established at Piratininga in 1554; and the roll of alumni of these two schools contains the most prominent names of early Brazilian literature and jurisprudence. The University of the City of Mexico opened its doors to students in June 1553; and two years later saw the establishment of the University of San Marcos, at Lima. In Ecuador, not to mention several colleges founded in the 16th century, the University of San Gregorio was opened at Quito in 1620; and the famous university of Santo Tomás at Bogotá dates its existence from the year 1627. The University of Chuquisaca (the modern Sucre) in Bolivia, the University of Córdoba in what is now the Argentine Republic, and the College of Santa Rosa which afterward became the University of Caracas, were all founded in the 17th century.

During the three centuries of the colonial period, no part of the world furnished a greater amount of historical material. The single national library of Santiago de Chile contains a catalogued collection of 2,740 manuscripts by the Jesuits alone. The material is indeed somewhat monotonous; and a larger space is devoted to monastic and episcopal interests than accords with our northern tastes. In reading these old authors, one is often reminded of the wide difference between the 16th or 17th century and some parts of the world in the 20th; as when Antonio de Leon Pinela, scholar and poet, historiographer of the Indies, authorized by royal order to lay three continents and the isles of the ocean under contribution for light and knowledge, seriously discusses the gravity of the sin of drinking chocolate on fast-days.

Foremost upon the long roll of early chroniclers stands the princely name of Ixtlilxóchitl, the descendant of the ancient chiefs of Texcoco. Three of the family acquired literary reputations; but the one here meant bore the Christian appellation of Fernando de Alva. His vast knowledge of native languages, songs, traditions, and pictographs procured him employment as interpreter to the viceroy; and about the beginning of the 17th century that ruler employed him to write in Spanish a history of his race. No one was equally qualified. His style alone has earned for him, from Europeans, the titles of the Cicero and the Livy of Anáhuac. His industry and his opportunities were equally great. He was personally acquainted with all the Indian sages — some over 100 years old — who had seen the empire of Motecuhzoma at the height of its glory. His work, in 13 books, began with the oldest traditions, and came down to his own time. The 13th book, dealing with the Spanish conquest, was printed separately in Mexico in 1829; but the whole is now accessible to the general reader in the French translation of Ternaux Compans. Carlos de Sigüenza y Góngora (1645–1700) acquired a high reputation for writing a similar history from the materials furnished by Ixtlilxochitl. Although far from being the only native work of importance, that of the Indian prince is the most interesting product of the aboriginal mind. The translator, in his preface, names other natives who attempted history. The most successful of these was Tezozomoc, who wrote (about 1598) a minute and circumstantial history of the Aztec nation. As he and Ixtlilxóchitl were not of the same nation, they had their partialities, and do not always agree with each other or with the Spanish chroniclers.

Of the many writers belonging to the monastic orders who made valuable contributions to Indian ethnology and early colonial history, none is more widely known than Francisco Bernardino Sahagún, who went to Mexico as a young man in 1529 and died there in 1590, after spending 61 years in teaching the Indians. He acquired such facility in using the native tongues that he wrote his great work, ‘Historia General de las Cosas de Nueva España,’ in one of them. It is a fine tribute to his human sympathies and his justice to a fallen race, that his contemporaries accused him of paganism. In the latter part of the 18th century, Francisco Xavier Clavijero (1721–93), a Jesuit and a native of Vera Cruz, spent many years as a missionary among the Indians, acquiring an extensive knowledge of their languages, customs, and traditions. Upon the suppression of the Jesuits he was compelled to leave his country, and he took refuge in Italy, where he wrote in Italian his great work ‘Storia Antica del Messico’ (4 vols., 1780–3). Although the work is not free from the inaccuracy that belongs to almost everything written in that age and from materials so uncertain, it has been the great storehouse of information regarding the ancient inhabitants of Mexico.

No American historian of his time surpassed the Brazilian Sebastião Rocha Pitta (1660–1738), a graduate of the ancient Jesuit college of Bahia. His great work ‘Historia da America Portugueza desde o seu Descobrimento até o Anno 1724’ is the outcome of great labor and fidelity. Not a few of the early historical productions were in verse; but these were usually commemorative of some particular event. One of the most extensive of these rhyming chronicles was that entitled ‘Elegías de Varones Ilustres,’ written by Juan de Castellanos, one of the original *conquistadores* of Venezuela.

Numerous epics, half history, half romance, were written in Latin America about the episodes of the conquest. Of these the ‘Arauco Domado’ is one of the earliest and most famous. Of all the native American races, the Araucans of Chile possessed in the highest degree those qualities that make up the ideal of manhood,—bodily strength and activity, intelligence, honorable truthfulness, indomitable courage, and love of independence. The Incas had never been able to subdue them; and they resisted the Spaniards with varying results 186 years, when in 1732 their independence south of the Bío-Bío River was acknowledged by treaty. During one of the periods of Spanish success, when Santiago and Valdivia were founded, Diego Hurtado de Mendoza led a party to the conquest of Chiloe in 1558. Among his followers was a young poet, Alonso de Ercilla y Zúñiga, who began by the nightly camp-fires to write a narrative of the war. Being afterward banished for supposed complicity in some attempt at revolt, he returned to Spain and lived in great poverty; but completed his poem ‘La Araucana,’ which has been praised as one of the truly great epics of the world. The Peruvian poet Pedro de Oña recast the epic and produced the shorter and inferior ‘Arauco Domado.’ It is to be regretted that from the fact of their living and writing in Spain, Ercilla y Zúñiga, together with Garcilaso de la Vega, the descendant of the Incas, cannot be reckoned among American authors. Another famous epic dealing with episodes of the conquest is the ‘Lima Fundada,’ composed by the Peruvian poet Pedro de Peralta y Barnuevo (1663–1743); a man of almost universal genius and attainments, as is attested by his numerous writings upon a wide range of subjects. A Mexican bishop, Bernardo Balbuena, who died in 1627, left a descriptive patriotic poem of great literary worth, entitled ‘La Grandeza de México’; a pastoral called ‘El Siglo de Oro,’ the scene of which is laid in the New World; and ‘El Bernardo,’ an epic in three volumes.

Brazil presented in the 18th century two epic poets of distinction, José da Santa-Rita Durão and José Basilio da Gama. The former is best known to the present age by his epic ‘Caramurú.’ The hero, Diego Alvares Correa, is a personage of actual history,—a Portuguese adventurer, who with a number of others was shipwrecked on the Brazilian coast about 1509. They were able to save a good part of their effects, including arms and ammunition; and by the possession of these, Alvares became a powerful chief by the name of Caramurú (Man-of-fire), and played an important part in the history of the early Brazilian settlements. The poet has embroidered the tale with a golden thread of romance by introducing as his heroine the beautiful Indian maiden Paraguassú, the Brazilian Pocahontas. Da Gama's epic, the ‘Uruguay,’ although containing some fine descriptive passages, is not of equal merit. It is a polemic against the Jesuits, accusing them of trying to found an ecclesiastical empire; and fails to do justice to their civilizing influence.

No other American writer of colonial times was surrounded with such a halo of mystery and glory as Juana Inés de Azbaje y Ramírez (1651–94), more generally known as Sor Juana Inés de la Cruz. Her beauty, genius, and learning were alike celebrated in the most exalted terms; and she was called by her admirers «the Tenth Muse.» She was the one peerless star of the viceregal court of Mexico. Suddenly, for reasons known to herself, she forsook domestic ties and the splendors of a court for the seclusion of a convent. But she could not escape from her fame; and the highest dignitaries in Church and state sought the wisdom that dropped from her inspired lips. Her modesty was equal to her other virtues; and when twice elected abbess she declined the honor. Her principal dramas, ‘Amor es Laberinto,’ ‘Los Empeños de Una Casa,’ and ‘Ovillejos,’ treat of love, jealousy, desertion, unrequited affection, and like human themes, and were written prior to her retirement into the religious life.

As is well known, the «Golden Era» of the literature of the Iberian peninsula, which reached its height during the lifetime of Camoens, of Cervantes, and of Lope de Vega, was followed by a period of rapid literary and political decadence extending well into the 18th century. Numerous traces are to be found of an early influence, on the one hand of the Encyclopædists, and on the other of Rousseau. More important still was the revival of interest in the physical sciences, which was particularly in evidence on the plateaus of New Granada and Mexico.

The pioneer of this movement was José Celestino Mutis, a native of Cádiz, who came to America in 1760 along with Mesio de la Cerda, then recently appointed viceroy of New Granada. He was made professor of mathematics in the College of Nuestra Señora del Rosario; and it was due to his efforts that the Observatory of Bogotá was built, at that time the finest in the New World. He devoted 40 years to the botany of those regions, and determined the species that yield quinine, balsam of tolu, balsam of Peru, and other valuable products. He was also the patron and instructor of a whole generation of men whose names are honorable in the history of science. Of those none was more famous, or more unfortunate, than Francisco José de Caldas. He was one of the earliest scientists in America to make and record meteorological observations; and he measured with great accuracy the altitudes of Chimborazo and Tunguragua. He accompanied Mutis in his botanical explorations, and in 1804 was made director of the observatory. In 1816, when revolution was all abroad in Spanish America, a Spanish commander, Morillo, took possession of Bogotá. He knew the republican preferences of the professors; and they knew their consequent fate. On bended knees Caldas begged for a year of close confinement prior to his execution, in order that he might finish the great botanical work that had been in progress half a century, and the plan of which he alone understood; but he plead to insensate ears, and he and all the savants who had not effected their escape were butchered.

Meanwhile in Mexico, the astronomical observations of Velázquez y Cárdenas, Alzate y Ramírez, and León y Gama were attracting the attention of the French Academy and the leading astronomers of Europe; the Botanic Garden was established; and the Royal School of Mines and the Academy of Fine Arts were founded, — institutions which earned the unstinted encomiums of Humboldt.

The accession of Philip V., the grandson of Louis XIV. of France to the throne of Spain, was distinguished by the advent of French influences, and the founding of academies and literary societies. The Spanish Royal Academy and the Lisbon Royal Academy of Sciences were established in 1714, and numerous societies, formed upon French or Italian models, sprang up in the Peninsula and the colonies, being especially noticeable in Brazil and the regions of the Plata.

It is in colonial Venezuela that we first meet, on American soil, with the Basques of the Pyrenees — a people that are the living enigma of ethnology, without known kinship among the races of men. Shrewd, energetic, sturdy maintainers of liberty, they came over in great numbers in the 18th century, not to dig for gold, but to clear farms and introduce the culture of cocoa, cotton, coffee, and indigo. To them were largely due the material prosperity of Venezuela and its readiness to cast off the Spanish yoke. The liberator Simón Bolívar was a Basque, as were many of his principal followers. For the past hundred years the stream of Basque emigration has been toward the region of the Plata, where they have contributed to make the Argentine Republic a second New England; but they are scattered everywhere, and recognized by their industry, thrift, and un-Castilian names, as Icazbalceta, the Mexican archæologist; Narciso Aréstegui of Peru, author of the historical novel 'El Padre Oraní'; the brothers Amunátegui of Chile, authors of 'Los Precursores de la Independencia de Chile'; Anauzamendí, Arrechaveleta, Goicoerrotea, etc.

The Revolutionary Period.—The yoke of Spain, however legitimate, had long been felt to be heavy on the neck of her colonies; and the prostration of the Iberian peninsula beneath the heel of Napoleon furnished an opportunity for insurrections, which in 1810 broke out almost simultaneously in Mexico, Venezuela, New Granada, Quito, Chile, and Buenos Ayres. The last viceroys of Mexico and Peru departed in 1821; and the independent empire of Brazil was proclaimed 12 Oct. 1822. That date may be held to close the revolutionary period, considered as a struggle for national independence.

One poet of the revolution, José Joaquín Olmedo of Ecuador (1781–1847), rises far above all others for the sublimity and classic finish of his style, which earned for him the epithet of «the American Pindar»; and it is no exaggeration to say that he possessed a magnificence of rhetoric and a power of patriotic exaltation such as few poets besides the great Theban have exhibited. Olmedo's masterpiece is his 'Canto á Junín,' an epic ode without an equal in the Spanish language. Some of the patriotic poems of Numa Pompilio Llona of Peru are especially fine; and the sonnet to Bolívar by the Peruvian Adolfo García is one of the most beautiful compositions of its kind.

The name of Andrés Bello recalls all that is ripest and best in Latin-American scholarship, statesmanship, and patriotism. The teacher of Bolívar, the personal friend and companion of Humboldt, in the inception of the revolution Bello took his place by the side of his illustrious pupil. He prepared the great civil code that became law in 1855; and wrote treatises on international law, literary history, grammar, rhetoric, philology, pedagogics, and mental philosophy. To crown all, his poetic temperament, added to his clear and comprehensive intellect, made him one of the greatest masters of Castilian verse. His 'Agricultura en la Zona Tórrida' is a magnificent georgic of the remote south; and not less admired is his 'Oración por Todos,' — suggested by Victor Hugo's 'Prière pour Tous.'

Of the revolutionary heroes one of the most prolific writers was Carlos María de Bustamante (1774–1848), the author of the Mexican «declaration of independence.» During the war he was four times a prisoner. His greatest literary work was a history of the Mexican revolution in six quarto volumes; and he was the author of several other considerable works on Mexican affairs.

The revolution in the region watered by the Plata was illustrated by the names and writings of Mariano Moreno, the disciple of Adam

Smith; Estebán Lena y Patrón, diplomat, editor, and poet, the author of ‘La Libertad de Lima’; the philosophic Juan Crisostomo Lafinur, famed for his beautiful elegy on the death of Gen. Belgrano, the hero of Tucumán; and Vicente López y Planes, who wrote ‘El Triunfo Argentino’ in honor of the repulse of the English invasion of Buenos Ayres (1806–7), and also composed the national hymn of the republic. During the period under consideration, the literary tone of Brazil presented a more placid character, due to her exemption from the violent contests that were agitating the remainder of the continent. This difference of tone is finely exemplified in the writings of Domingo Borges de Barros, Viscount of Pedra Branca (1783–1855), — more frequently spoken of simply as Pedra Branca.

The Period of Independence.— Of the present 16 independent republics of Latin America, three great countries — Chile, the Argentine Republic, and Brazil — have attained in this century to greater importance than the early seats of aboriginal or viceregal splendor. Chile had been a doubtful appendage of the empire of the Incas; after the downfall of that dynasty, the brave Araucans contested its possession with the Spanish invaders 180 years; and when at length they were driven to the regions south of the Bío-Bío River, the northern portion was held as a part of the vice-royalty of Peru until the time of the revolution. Independence was secured of the vice-royalty in 1817; and the next few years were taken up with domestic wrangling and political experiments, until the present constitution was adopted in 1833. Since that time there has been continuous progress and prosperity. The settlements in the region of the Plata and its great tributaries were made under unusual disadvantages; and it was only in 1776 that Buenos Ayres was made the residence of a viceroy, whose authority extended over the present Argentine Republic, Bolivia, Paraguay, and Uruguay. The existence of this government was neither tranquil nor durable; and active revolutionary measures were begun in 1813. Independence was secured and a federal constitution adopted in 1825. Half a century of domestic factions and foreign wars succeeded; and now the country has enjoyed 20 years of peace and prosperity, during which its growth has been rapid and healthy.

Politics and literature are much allied in Latin America. The beginnings of revolution had little to do with theories of government or abstract rights of man; they aimed at the immediate ends of free trade and relief from foreign domination. There has always been a tendency to run into dictatorial government. There is a permanent party — including the powerful influence of the Church — in favor of a strong personal government and a large amount of interference with individual interests. At the same time there have been large numbers with the apparent ideal of «every man his own lawgiver, judge, and executioner.» The contest has been between these parties, over the question of how much government people require. The Church and the older men generally have upheld rule and authority; literary men — the young, enthusiastic, and poetic — have as generally striven for larger freedom.

Writers on Political Science.— The necessities arising from the acquisition of national independence caused such subjects as political economy, international and constitutional law, and public education, to occupy a prominent place in the minds of the founders of the new republics. Early in the century, treatises on these topics began to appear which won the encomiums of eminent European authorities. The valuable labors of Andrés Bello have been already referred to. Juan Bautista Alberdi, the Argentine jurist (born 1808), is entitled to take rank in the class of publicists represented in Europe by Guizot, De Tocqueville, and the Mills, and by Kent and Story in the United States. He was the author of the Argentine constitution, and of eight substantial works. A celebrated work of more recent date is ‘La Reforma Política’ of Dr. Rafael Núñez. He is an ultra-conservative, and his great treatise favors a «paternal despotism.» Rafael Seijas of Venezuela is a distinguished jurist who has written ably upon international law; he is also a diligent student of English, French, and Italian literatures, upon which he has given to the public some interesting articles.

After Andrés Bello, few promoters of public education have better earned the esteem of their countrymen than Domingo Faustino Sarmiento, an Argentine born in 1811. While minister to the United States (1865–7) he made a careful study of the school system, and the results of his investigations were given to the world in an essay entitled ‘Las Escuelas: Base de la Prosperidad de los Estados Unidos.’ He was favored by the personal friendship and assistance of Horace Mann, the best-known educationalist that the United States has ever produced. Sarmiento was president of the Argentine Republic from 1868 to 1874. As a writer he was gifted with great originality and vigor of expression, which make his ‘Recuerdos de Provincia’ one of the most entertaining books of its kind. His masterpiece is entitled ‘Facundo,’ in which he presents in a series of glowing pictures a comprehensive survey of the points of difference between civilization and barbarism.

Historians.— History has always been well represented in the literature of Latin America. Most of the States have comprehensive histories, the fruit of much research, and written with careful regard to facts and form. There are also numerous historical works of more limited scope, devoted to certain districts or periods, or gathered around the achievements of individuals.

Father Suárez informs his readers that in collecting material for his history of Ecuador, he examined 10,000 packages of papers filed in the Archives of the Indies in Seville. León Fernández, finding no history of his native state of Costa Rica, set about collecting materials; and in 1881–6 he gave to the world 1,917 closely printed pages of documents, not previously edited, bearing upon the history of a country of less than a quarter of a million of inhabitants, whose first printing-press was set up in 1830. The history of Mexico from the earliest times to the death of Maximilian, by Niceto de Zamacóis, fills 18 thick octavo volumes. Lorenzo Montúfar's ‘Reseña Histórica de Centro-América’ — a mere outline — makes seven volumes royal octavo; and the recent ‘Historia General de Chile,’ by Diego Barros Arana, comprises 13 octavo volumes. Another Chilean historian, Benjamín Vicuña Mackenna, has written an account of a single campaign, ‘Historia de la Campaña de Tarapacá,’ in two volumes of a thousand pages each; his collected historical works fill 15 volumes. The government of Venezuela is now publishing the historical essays of Arístides Rojas relative to that country in 14 volumes. The third volume of the ‘Historia General de la República del Ecuador,’ by Suárez, reaches only to the year 1718. Then there are the exhaustive works relating to Peru, of which we may mention the magnificent treatise of Raimondi, cut short in its fourth volume by the author's death in 1892. The tenth volume of the ‘Historia de la República Argentina’ by Vicente Fidel López has just appeared, and its venerable author is continuing the work with an industry unchecked by the weight of his 76 years.

Among special historical works which even the briefest enumeration would include, the most widely known are probably the twin histories of Gen. Bartolomé Mitre of Buenos Ayres (born 1821), bearing the titles ‘Historia de Belgrano y de la Independencia Argentina,’ and ‘Historia de San Martín y de la Emancipación Sud-Americana.’ Special mention should be given to the standard work of Rafael María Baralt of Maracaibo (1810–60), entitled ‘Resumen de la Historia Antigua y Moderna de Venezuela,’ which Arístides Rojas has more recently supplemented by seven «studies» on various epochs and aspects of the national history. Two histories written by Colombians rank very high; namely, the ‘Historia de la Nueva Granada’ by José Antonio de Plaza, and the ‘Historia de la Revolución de Colombia,’ by José Manuel Restrepo. The historical works of Mariano Paz Soldán are characterized by that patient accumulation of facts which is supposed to distinguish German scholarship; his reputation rests more especially upon his ‘Historia del Perú Independiente de 1819 á 1827,’ and his ‘Diccionario Geográfico-Estadístico del Perú.’

Manuel Orozco y Berra gave to the public in 1880 an elaborate account of the ancient nations of Mexico in his ‘Historia Antigua y de la Conquista de México,’ in which he goes over the whole subject treated by Prescott, and adds a profusion of further details. Vicente Fidel López, author of the large ‘History of the Argentine Republic’ previously mentioned, has written two historical works of great interest to the ethnologist and antiquarian; they are entitled ‘Las Razas del Perú Anteriores á la Conquista,’ and ‘Les Races Aryennes au Pérou.’

Brazil has produced several historical writers of merit. The standard history is by Fr. Antonio de Varnhagen, and is entitled ‘Historia General do Brazil.’ His descriptive passages are often particularly fine. He published in 1860 an interesting little book, ‘A Caça no Brazil,’ — the first of the kind that has appeared in South America, — describing the wild animals and the modes of pursuing them in the great forests and on the plains of that country. Pereira da Silva's ‘Historia da Fundação do Imperio Brazileiro’ is one of the standard works of Brazilian history.

Literary Critics.— Opinions on authors and books occupy a larger relative space in Latin-American literature than in that of Anglo-Saxon nations. Criticism deals less with the views and statements of an author than with his manner of presenting them; so by treating literature as a fine art, along with painting and music, it becomes in itself a fine art, requiring artistic faculties carefully cultivated.

Criticism, as a fine art, has been cultivated in Latin America with surprising assiduity; and includes among its eminent masters such men as Torres Caicedo, Miguel Luis Amunátegui, and Calixto Oyuela, the author of ‘Estudios y Artículos Literarios.’ Rafael M. Merchán, the Cuban exile, of whom it has been elegantly said that he «writes with a gloved hand and a pen of gold,» made his home in Bogotá, and became secretary to the President. His poetic temperament, wide reading, and fine discernment furnish the qualifications that make him above all a critic, and which shine conspicuously in his study on Juan Clemente Zenea and in his ‘Estudios Críticos.’

Of all this wealth of critical discussion, no part affords more attractive reading than the works of Martín García Mérou, recently Argentine minister to the United States. They show a wide familiarity with the literatures of Europe and America, a delicate judgment, and that kind of fairness that can appreciate the merits of one with whom he does not agree. His essay on the poet Echeverria may be cited as one of his most thorough studies.

Those most interested in the subject of Latin-American literature are now eagerly awaiting the great work in preparation by Prof. García Velloso, of Buenos Ayres. It is to be a comprehensive history of the literature of the entire southern continent.

Novelists.— The novel did not begin to assume prominence in Latin America until about 1860; and the class of writers whose specialty is prose fiction is still relatively small. Jorge Isaaks, the Colombian poet, is widely known by his ‘Maria,’ a simple and pathetic story of rural life, a translation of which has been extensively read in the United States. His compatriot Julio Arboleda has given the public a bright contrast to this sombre picture, in his sparkling romance ‘Casimiro el Montañés.’

The collection of stories known as ‘La Linterna Mágica,’ written by José T. del Cuellar, of Mexico, has been deservedly popular. Ignacio M. Altamirano, a Mexican lawyer and orator of pure Indian blood, has left a novel, ‘Clemencia,’ which for style and pathos has seldom been surpassed. The Mexican historian Orozco y Berra wrote a beautiful novel, ‘Escenas de Treinta Años,’ relating the experiences of an unfortunate disappointed invalid. Dr. J. J. Fernández Lizardi, generally known by the pseudonym of «El Pensador Mexicano,» has revived the old Spanish picaresque type of romance in his ‘Periquillo Sarmiento.’

The Argentine historian Vicente Fidel López is the author of a thrilling historical novel entitled ‘La Novia del Hereje,’ the scene of which is laid in Lima in the time of the Inquisition; but the favorite romance of the region of the Plata is the ‘Amalia’ of José Mármol, one of the most beautiful of modern novels. Chile has produced several noted works of fiction, among which the ‘Alberto el Jugador’ of the poetess Rosario Orrego de Uribe, ‘La Dote de una Joven,’ by Vicente Grez, and the historical novel ‘Los Héroes del Pacífico,’ by Ramón Pacheco, are much admired. ‘Contra la Marea,’ by the Chilean Alberto del Solar, is one of the most powerful of recent American novels.

Quite a number of romances have been founded upon Indian legends, or tell of Indian life and customs. Two of the best of these are quite recent,— the ‹Painé› and ‹Relmú› of the Argentine publicist Estanislao S. Zeballos, who, still young, combines every form of literary activity. The ‹Huincahual,› by Alberto del Solar, is one of the most able productions of this class, and gives evidence of a diligent study of Araucan customs and character. The Brazilian novelist José Martinião Alencar wrote two famous Indian romances, entitled ‹Iracema› and ‹Guarany.› ‹Iracema› develops the main feature of the story of John Smith and Pocahontas. The other novel tells how a young Indian loves a Portuguese woman. Carlos Gomes has transformed it into an opera which has become well known in Europe, retaining the name of ‹Guarany.›

Besides Martinião Alencar, Brazil has produced during the present century two highly successful writers of prose fiction,— Joaquim Manoel de Macedo and Bernardo Guimarães. Macedo was a doctor of medicine, a professor in the University of Rio, a member of Congress, and a prolific writer in prose and verse. His ‹Moreninha› (Brunette), published in 1840, undertook for the first time to portray Brazilian society as it really was; it enjoyed extraordinary popularity, as did also his ‹Senhora,› which some critics consider superior to ‹Moreninha.› Guimarães is one of the most powerful and original writers of Brazil. ‹Ermitão de Muquem› is considered his best novel. It is written in three versions or styles: one plain prose, one poetic prose, and one peculiar to the author, like the styles of Bentham and Carlyle. His ‹Seminarista› is a romance with a tragic outcome, and is directed against the enforced celibacy of the clergy.

Poets and Dramatists.— The Spanish and Portuguese languages lend themselves so readily to versification that the amount of poetry produced is enormous. Juan León Mera published in 1868 a critical history of the poets of Ecuador, at a time when many persons were not aware that that country had ever possessed any. Cortés, in his ‹Parnaso Peruano,› fills 800 pages with choice extracts from 44 of the leading poets of Peru; and the great anthology of Menéndez y Pelayo, consisting of four large octavo volumes of poetical selections, purports to give «only the very best that Spanish-American writers have produced in verse.»

Four names may represent the different styles of poetry cultivated in Mexico. Manuel Carpio, a physician by profession, was well read in Greek and Roman literatures, and a still more diligent student of Jewish lore. His ‹Tierra Santa› is a work of great learning, not inferior to Robinson's ‹Biblical Researches.› He is best known, however, by his poems; one of which, ‹La Cena de Baltasar,› shows remarkable descriptive power. Fernando Calderón is distinguished rather by the sweetness than the strength of his verse. The tenderness of his sentiments is well displayed in ‹Hermán, ó la Vuelta del Cruzado.› He was the author of a comedy, entitled ‹Á Ninguna de las Tres,› intended as a satire on those who return from foreign travel only to find fault with everything at home. José Joaquin Pesado has at once tenderness, sublimity, and classic finish. In ‹La Revelación› he has essayed to wake anew the harp which Dante swept; and he has given to his countrymen in their own tongue the odes of Horace and the psalms of David, along with some minor poems of rare beauty. Last of all, in ‹Los Aztecas› he has sought to restore and interpret the hymns, chants, and lost lore of the primitive races of Anáhuac. Manuel Acuña, whose unhappy life extended only from 1849 to 1873, holds the place among Mexican poets that Edgar A. Poe does among those of the United States. In his nervous, delicate nature, poetry was a morbid secretion, like the pearl in the oyster; and he became the self-appointed priest and prophet of sorrow and disappointment. His most noted poems are ‹El Pasado,› ‹Á Rosario,› and a drama entitled ‹Gloria.›

One of the most enduring masterpieces of Spanish-American verse is ‹Gonzalo de Oyón,› a beautifully wrought tale based upon an episode in the early history of the country. Its author, Julio Arboleda (1817–62), held the foremost rank among the Colombian writers of the first half of this century. Another Colombian writer who reflects the sentiments of the past is Silveria Espinosa de Rendón, who laments the expulsion of the Jesuits in her ‹Lágrimas i Recuerdos.› In Bogotá, Antonio José Restrepo is the poet laureate. The most celebrated of his longer poems are ‹Un Canto› and ‹El Dios Pan›; in which the author shows himself to be a liberalist of the most pronounced type, who writes in utter fearlessness of all absolute rulers for man's mind, body, or estate.

The extensive writings of Esteban Echeverría (1809–51) contain many passages that are weak and commonplace; but he stands forth as the national poet of the Argentine Republic, reflecting the life and thought found on its vast plains and along its mighty rivers. The productions to which his fame is chiefly due are ‹Avellaneda,› ‹La Revolución del Sud,› and ‹La Cautiva.› The last-named poem, an Indian story of the Pampas, deserves a place by the side of ‹Hiawatha,› which it resembles in the unaffected beauty of its descriptive passages and the flowing simplicity of its versification. Martín Coronado and Rafael Obligado, two of the leading poets of Buenos Ayres, are disciples of Echeverría, though of different types. Coronado's verse is impassioned and dazzling; while Obligado's muse loves the contentment of the family hearth or the shady banks of the majestic Paraná, where the stillness is broken only by the cry of a wild bird or the lazy dip of an oar.

The poems of Arnaldo Márquez and Clemente Althaus of Peru take a very high rank for their beauty and tenderness of sentiment as well as purity of style. The ‹Noche de Dolor en las Montañas› and the ‹Canto de la Vida› of the Peruvian Numa Pompilio Llona are compositions which will be admired for centuries. The ‹Romances Americanos› of the Chilean poet Carlos Walker Martínez, and the ‹Flores del Aire› of Dr. Adán Quiroga of Argentina, are collections of poems of great merit and originality. Compositions of remarkable beauty will be found in the ‹Brisas del Mar› of the Peruvian Manuel Nicolás Corpancho, the ‹Armonías› of Guillermo Blest Gana of Chile, and the ‹Flores Silvestres› of Francisco

Javier de Acha of Uruguay. José Batrés y Montúfar of Guatemala, a lyric poet of merit, is one of the most noted satirists of America. Matías Córdoba and García Goyena of Guatemala have been justly compared, as fabulists, to Æsop and La Fontaine.

Among Brazilian writers of the 19th century, two representative poets may be selected: Antonio Gonçalves Dias and Domingos José Gonçalves Magalhães. Dias was even more esteemed as a patriot than as a poet; and was much employed by the late emperor in carrying out educational and other reforms, in which that estimable sovereign was deeply interested. The successive issues of miscellaneous poems by Dias are now known collectively as his ‹Canteiros,› and won the enthusiastic commendation of the Portuguese critic Herculão. He also left some Indian epics, and the two dramas, ‹Leonor de Mendonca› and ‹Sextilhas de Frei Antão.› He was so far honored in his own country that his fellow townsmen erected a statue to his memory, with an inscription declaring him the foremost poet of Brazil. The best productions of Magalhães are a tragedy entitled ‹Antonio José ou o Poeta e a Inquisição,› and ‹A Confederação dos Tamayos,› the latter an epic founded on an outbreak of the Tamayo and other Indians.

Summary.— On looking across the Rio Grande at authors and books beyond, one is struck by some points that contrast with our northern life. There, public men are writers. Whether it be that political life stimulates literary activity, or that the latter is a passport to the former, presidents, senators, cabinet officers, judges, and ministers plenipotentiary, all write. Many of them read, write, and speak a number of languages,— an accomplishment so rare in Saxon America that an envoy is sometimes sent on an important mission without being able to speak the language of the country to which he is accredited.

Again, the literary men of the far South, with scarce an exception, write poetry as readily as prose. Nothing could be more incongruous than the idea of the average public man in the United States writing poetry. Something is due to the character of the language, that a stranger does not readily appreciate. In Spanish and Portuguese verse the words roll and swell, liquid and lengthy, like the waves of the sea, and tempt one to prolong the billowy movement. Latin-American verse is glowingly descriptive, or plaintive and tender, with an occasional tinge of melancholy; but it all possesses a healthy and natural tone, and has not yet been infected by the morbid unrest and hopeless cynicism that characterize much of the recent poetry of older nations.

The great bulk of the people from Texas to Cape Horn cannot read and write. Great efforts are put forth to remedy this state of things by general education, and much has already been accomplished. In the United States, books are intended for a reading class numbering many millions, and are made as cheap as possible, so as to come within their reach. In Latin America there are no millions to read, and the best books are addressed to a relatively small class. As sales are limited, large works of general interest or permanent value are published or aided by the governments, or by wealthy and public-spirited individuals.

Of the lighter literature of the southern republics, a large part first appears in the various *revistas* and other literary periodicals maintained in all the principal cities. It consists principally of odes, sonnets, short stories, and essays. These essays embrace every variety of subject: the authors traverse — often literally — the Old World and the New, view them geographically, ethnologically, sociologically, and write under such captions as ‹A Winter in Russia,› ‹The Bedouins of the City,› ‹The Literature of Slang,› or ‹The History of an Umbrella.› The subjects are generally treated, so as to be pleasant reading, and afford at least as much entertainment as information.

Novelists and dramatists are under a great disadvantage, having no protective tariff to save them from European, and especially French, competition. Editors and managers find translations cheaper and easier to obtain than native productions. There is happily a growing reaction in favor of native writers who represent American subjects as seen by American eyes. When the cultivated public becomes fully aware of the greater genuineness of these domestic productions, native talent will have an ampler field; and there is every reason to believe that it will be prepared to satisfy the fullest demand.

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Latin Church. See Roman Catholic Church.

Latin Empire. See Byzantine Empire.

Latin Language, The. One of the Indo-European family of languages, spoken in Latium and especially in Rome and extended with the Roman rule over the ancient world; the source from which the Romance languages (Italian, French, Spanish, Portuguese) are derived.

As one of the Indo-European languages Latin shows a relationship in vocabulary, in inflected forms and in syntactical structure to other branches, Greek, Sanskrit, Germanic, Slavic, but according to the theory now generally accepted this indicates linguistic relationship only and does not necessarily imply an ethnological connection between the races speaking these languages. It was long held that the resemblance between the Greek and the Latin was so close as to warrant the belief that the two languages (and races) were derived from a common stock, but this theory (of a Græco-Italian unity) is now generally abandoned. Probably the closest connection of Latin is with the Celtic languages.

Latin was one of a group of dialects spoken in central Italy. The other best known and most closely related Italic dialects are the Faliscan (which is scarcely more than a local variety of Latin) and the Osco-Umbrian. The latter was an extensive family of dialects spoken in the mountain districts of central Italy, especially in Samnium, and in early times was more widely distributed than the Latin and of at least equal advancement. The Oscan is represented by a number of inscriptions, of which the *Tabula Bantina* is the longest, and the Umbrian by the Iguvinian Tables, of some 4,000 words in length.

The Latin language was reduced to writing at an early period by the use of an alphabet derived from the Greek alphabet of the town of Cumæ. Of this earliest period we have scanty records in inscriptions from about 500 B.C. down (the Fibula of Palestrina, the Duenos inscription) and in the rituals of the Salii and the Arval Brethren. These were not wholly intelligible to the Romans of the classical times and are still in part obscure; but enough is clear to show that the language was at that period a raw dialect of limited vocabulary, incapable as yet of expressing the thoughts or emotions of a highly civilized people.

The change from a rustic dialect to a literary language took place in the 3d and 2d centuries B.C. It was brought about by two causes. In the first place, through the extension of Roman power over the whole of Italy, Latin became the language of trade and of official intercourse throughout the peninsula; in this process of expansion the language reflected the expanding interests and necessities of the people who spoke it, becoming by use richer in vocabulary, more varied and at the same time more regular in structure, and gaining by its contact with the Oscan and Umbrian. This process was aided also by the constant practice of oratory, which the workings of a free constitution called forth. In the second place, the contact with the Greeks of southern Italy gave an immense and lasting stimulus to literary production. At first this took the form of the drama and the epic, and the necessities of verse, particularly of the Greek hexameter, required a conventional distinction between long syllables and short, such as the native rhythms, which were mainly accentual, had not required. The quantitive character thus given to the language and the imaginative enrichment which came from its employment in poetry affected chiefly the language of literature. On the other hand, in the spoken Latin, the giving up of the Indo-European accentuation and the adoption of a new accent-law, by which the main accent was restricted to the penult and ante-penult, resulted in the frequent shortening of the unaccented final syllable, especially in iambic words, and in the occasional dropping of final consonants. Acting in different directions, as a conservative force in the literary Latin, as a cause of rapid change in the spoken language, these influences produced the beginning of that separation between the language of books and the speech of the common people, which, though it occurs to some degree in all languages, is a most marked peculiarity in the development of the Latin language.

For about a century and a half before the beginning of our era and for an equal time after that date the Latin of books remained almost unchanged in sounds and forms; its history during this time deals with its growth and change as an instrument of literature. The Classical Period (the Ciceronian and Augustan) saw the culmination of Latin style, first in prose and then in poetry. Cicero was an extraordinary master of style and in his hands the language lost its archaic stiffness of structure and became a flexible and a complex means of expression. Better than any other Latin writer he used the periodic form of sentence, not as a mere rhetorical device, but as a suitable expression for a complete thought, with all its subordinations and interdependence, in a unified and harmonious structure. Cæsar also represents the simplest narrative prose, free from archaisms and absolutely unaffected and unadorned. In verse Vergil and Horace are types of the artistic use of imaginative speech, in which by a careful felicity of selection and combination language is made to convey poetic suggestion, without either the affectation of the Alexandrian school or the heaviness of Ennius or Lucretius.

The change from the Classical Period to the «Silver» Latin of the early empire is likewise chiefly stylistic and from this point of view it must be regarded as a change for the worse. To a considerable extent pleasure in the mere arts and tricks of expression took the place in Ovid and Martial of true poetic force and poetry became contaminated by rhetoric. In prose, however, the rhetorical and individualistic tendencies were less injurious; Tacitus, though he abandoned the periodic structure of Cicero and introduced into prose many words from the vocabulary of poetry, nevertheless used a style suited to his temperament and subject.

It is not worth while to follow in detail the later history of the literary Latin. It was in the main rhetorical and imitative and it lacked that vigor of thought which alone can maintain a vigorous linguistic life. To this general statement there are two exceptions. The Latin of the jurists kept up the tradition of accuracy and clearness, employing a technical vocabulary without rhetorical artifice, and the Christian writers, possessed by the supreme desire to convey a serious message to unlettered readers, continued the spirit, if not the form, of the better Latinity. With these exceptions, however, the Latin of literature is, after the 2d or 3d century, no longer in the fullest sense a living language.

Meanwhile the Latin of daily life, the language spoken by the common people of Rome, by slaves and provincials and soldiers, had continued to exist under the level of the literary language, from which it was separated about 250 B.C. The evidence for the spoken Latin during the later republic and the early empire is somewhat scanty, consisting of occasional inscriptions like the wall-writings of Pompeii or passages in authors like Petronius, in which the colloquial Latin is intentionally imitated. But the effect of the accent in the shortening of final syllables is to be seen even in Horace and Vergil and this tendency leads in some inscriptions to the loss of final consonants. After the 3d century of our era we have increasing evidence of change in sounds and forms. The vowel *e* and the diphthongs *æ*, *œ* were no longer clearly distinguished in sound, and were therefore confused in writing; *au* became *o*; *b* and *v* was interchanged; the softening of *c*, *t*, and *g* before *e* and *i* began; initial *h* was lost or was misplaced (this had begun in the time of Catullus). Still more marked was the loss of the distinction, probably never made with great precision in the ordinary speech, between long and short vowels, and the consequent reappearance of accentual verse. The disappearance of final consonants, especially *m* and *s*, destroyed the distinctive marks of gender and even of case, so that cases, being no longer distinct in form, were not clearly differentiated in usage. In syntax the older paratactic constructions, which are found in Plautus and occasionally throughout Latin literature, again appear and analytic idioms (*habere* as an auxiliary verb) began to displace the inflectional verb-forms; the use of prepositions weakened the force of the cases; conjunctions lost their original meaning, *quod*, for example, driving out other conjunctions. All these are steps toward the passage from Latin to the Romance languages. They went on at different rates in different parts of the empire and under different conditions, but the beginning of many can be traced back to early Latin and they are not to be thought of as accidents by which the Latin language was destroyed, but as entirely normal and natural changes which mark the progress of the language from the inflected stage to the comparatively uninflected condition of the Romance languages. From this point of view the Latin of literature is to be regarded as a deviation, in some sense artificial, from the normal life of the language.

The later use of Latin by scholars as a universal learned language and the employment of a corrupt Latin in diplomacy and government do not come within the limits of this article.

Bibliography.—There is a good sketch of the history of the Latin language in the 'Historische Grammatik d. lat. Sprache,' I. 1, by Stolz, and a longer history and discussion by Weise, 'Charakteristik d. lat. Sprache.'

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Latin Literature. Within the brief limits of the following sketch it will not be possible to describe fully the characteristics of single writers (for these special articles must be consulted); only a general history of Latin literature will be given, with a summary estimate of its value.

A division into periods will be found convenient, though such divisions in a continuous development must not be understood to imply abrupt changes.

1. *The Prehistoric Period down to* 240 B.C.—No complete writings from this period survive in their original form, but from fragments and chance allusions it is known to have been a period of native beginnings, as yet untouched by foreign influences. In poetry, which from its nature takes literary form before prose, we possess partly modernized fragments of religious ritual in verse, the forerunners of a kind of lyric. A few allusions seem to indicate the existence of the custom of chanting lays in honor of national or family heroes, which might under favoring conditions have flowed together into an epic, and many references and some later fragments show that village festivals, in Italy as in Greece, were celebrated with songs and dances of a mimetic and humorous character, out of which a subordinate kind of drama actually arose, even after the introduction of Greek comedy. Semi-ritualistic charms and farmers' maxims, of which Cato gives us specimens, might easily have been collected into a didactic poem on agriculture. In prose the legal codifications were already well advanced, and the many forms of official record furnished the material for history and, indeed, dictated its earliest annalistic form. Oratory, as might be expected, was in constant use in the senate, in popular assemblies, and for purposes of eulogy, and a speech of Appius Claudius Cæcus, delivered in the senate in 280 B.C., was still extant in the time of Cicero. Thus in several directions the germs of a native literature had appeared before the Greek influence was felt.

2. *The Period of Greek Influence, Beginning with* 240 B.C. *and Lasting for about a Century.* — Through the conquest of the Greek cities of southern Italy the Romans first became fully aware of the treasures of Greek literature, by that time practically complete. Its introduction into Roman life was due to a Greek slave, Livius Andronicus, who translated plays of the Greek 'New Comedy' (Meander and others) for presentation at the Roman festivals and put the 'Odyssey' into Saturnian verse to be used as a reading-book in schools. He thus gave a new impulse and direction both to dramatic and to epic poetry and he was followed in the drama by native Italians, Naevius, Plautus, and Ennius, and in the epic by Naevius, who wrote a history of the first Punic war in the native accentual verse-form. Ennius, the most influential writer of the period, continued the epic still further by writing in hexameters a history of the Roman race, which remained the national epic until the appearance of the 'Æneid.' Other dramatic writers followed, the tragedy being less original and less popular than the comedy. Ennius also gave literary form to satire, a peculiarly Italian product, written by him in various meters and on a variety of subjects and put into final form at a later period. The prose of this time was still mainly of a practical character. Cato the Censor wrote out and published many of his speeches for use as political pamphlets, composed a book of maxims drawn from his active life for the benefit of his son, some at least being in the form of letters, and wrote a treatise on farming which, in a partially modernized form, is still extant. The writing of history had already begun, in the Roman annalistic form, though in the Greek language, but Cato wrote a history of Italian towns in Latin. There was also considerable activity in legal writing, though systems of jurisprudence came somewhat later. This last was purely Roman and in general the Greek influence was less felt in prose, and the impulse to stylistic finish was less active than in poetry.

The period was thus one of beginnings in many lines. The stimulus of the Greek literature was almost a tyranny as to the form, especially in poetry, but in the writers of more original mind the Italian spirit and something of the Italian form, like the music and dances of comedy, still maintained itself. In the period of transition to Cicero's time (about 150–84 B.C.) the further growth of oratory, history, and jurisprudence in prose, and the writing of plays on Italian subjects and in native form showed that the Latin spirit was recovering from the first dominance of the Greek artistic form. In particular, it was during this time that the purely national satire received its permanent form and direction at the hands of Lucilius.

3. *The Ciceronian Age,* 83-43 B.C.— In this period, which is defined by the beginning and the end of Cicero's literary activity, Latin prose reached its culminating point, combining at last into a harmonious whole the earnestness of the Roman and something of Greek artistic skill. The practical national tendencies were still exemplified by Varro, who gave a long life to investigation and published works in many fields, in law, history, philosophy, grammar, and agriculture, with an almost exclusive attention to the matter rather than to the style. In history Sallust may be called the first of Roman historians, in the true sense of the word as distinguished from the annalists and antiquarians, but his style is intentionally archaic and not wholly natural. The period was especially rich also in political writings, in the form of biographies and memoirs, among which must be included the commentaries of Cæsar, historical in form, but written for a political purpose, and models of perfectly simple narrative in the purest diction. But the chief figure in the literature of the period was Cicero. He was a man of wide knowledge both of the earlier Roman oratory and of Greek rhetoric; he was equally interested in the theory and in the practice of public speaking, and his warmth of temperament and purity of taste in composition made him an eminent master of style. His writings have remained since his time the models and standard of Latin prose. Aside from his speeches, of which some 50 are extant, he left valuable works on rhetoric, some well-written treatises on philosophy, and a large and extremely interesting collection of letters, gathered and published after his death by his secretary.

In poetry also this period was second only to the Augustan Age. Lucertius, continuing the tradition of didactic poetry, wrote in hexameters an exposition of the atomic theory of Epicurus. The subject was in itself unsuited to poetry, but Lucretius has so infused into it his own moral earnestness and so interspersed and adorned the doctrines with passages of lofty beauty that the work is intensely Roman and is undoubtedly the greatest didactic poem in existence. In lyric poetry Catullus left behind him at his early death a few score of poems, almost all quite short and some of them overwrought with imagery and allusion in the Alexandrian manner, but of the purest lyric strain and in this one respect superior to the 'Odes' of Horace. If the fame of Catullus rested on the 'Attis' alone he would be called a great poet.

The Augustan Age, 43 B.C. *to* 14 A.D.— This period was, in contrast to the preceding, mainly an age of poetry. The loss of political freedom affected unfavorably both the public oratory and the political and historical prose. Scarcely an orator of the period has left more than an empty name and public speaking sank into declamation and rhetorical display. In history there is the one great name of Livy, but even he, though a friend of Augustus, found in the history of the past a kind of refuge from the political hopelessness of his own time. His style, in the narrower sense, was an adaptation of the periodic sentence structure of Cicero to the purpose of narrative, to which it is not entirely suited, but his descriptions — his "pictured page" — are wonderfully vivid. From him and from Plutarch's 'Lives' most of our popular conceptions of Roman history and character are derived.

But the conditions which were unfavorable to the highest kinds of prose composition fostered production in the unemotional and impersonal fields of technical writing. To this period belong the work of Vitruvius on architecture, the extremely learned work of Verrius Flaccus on lexicography and grammar, now unfortunately lost, and some important writers on law. It was, however, in poetry of high quality that the age was especially productive. Vergil, after some imitations of Theocritus and a very perfectly finished poem on farming, left behind him at his death the 'Æneid' in almost complete form, to become at once the great epic of Rome and in later times the most widely known of Latin poems. Horace, a Republican in his youth, who had fought at Pharsalus, continued the tradition of satire after the manner of Lucilius and wrote the four books of the 'Odes,' inferior to the poems of Catullus in lyric feeling, but superior in their attitude toward life and perhaps in their close stylistic texture. He also became at once a classic and has been the favorite poet of many men of society and of affairs. Tibullus and Propertius introduced elegiac poetry and seem in this field to have surpassed their Greek models. Ovid wrote a long poem embodying Greek myths, an account of the festivals of the Roman calendar, and a number of minor poems, all with an unrivaled technical skill; but he was a man of weak fibre and lacking in genuineness and his personal failings have lowered the tone of his writings.

Taken all together, this roll of names, though no one of them is quite of the very highest rank, entitles the Augustan Age to a place among the great periods of literary production.

The Ciceronian and Augustan periods are sometimes put together and called the Classical Period, or, in contrast with that which follows, the Golden Age of Latin Literature.

5. *The Silver Latin,* 14-117 A.D.— Two characteristics mark the literature of the early empire. On the one hand, technical skill in the craft of writing was never greater nor more generally exercised. Verse-composition was common and the versification was accurate and finished. But, on the other hand, the increasing tyrannies of Tiberius, Caligula, Nero, and Domitian suppressed independence of utterance and even of thought and the decrease in race-vigor weakened the nobler impulses to expression. Technical skill was therefore put to frivolous or ignoble uses and was directed by petty vanities into mere affectation, instead of being controlled by a reserved taste and a sober purpose. Poetry borrowed the rhetorical devices of prose and prose used the vocabulary of poetry.

But while this description is fairly applicable to most of the writers of this and the succeeding period, there were not a few writers who, though they were inevitably affected by the character of their times, were yet raised by interest in their subject or by refinement of taste almost to the level of the Classical Period. This was true in a measure of many of the writers on technical subjects, grammar, agriculture, medicine, law; such, for example, was the elder Pliny, who collected a sort of compendium of knowledge in his 'Naturalis Historia.' The philosopher and poet Seneca has been at times highly esteemed, but it is difficult to acquit him of insincerity and his closet-dramas betray his tendency to bombast. Quintilian, however, was a great teacher of rhetoric in the best sense and a writer of learning and taste, who would have been distinguished in any age. With him may be ranked, though on different grounds, the younger Pliny; the collection of his letters was made by himself and the letters were doubtless written for publication, so that they lack (except the correspondence with the Emperor Trajan) the interest of Cicero's letters, but Pliny was a man of excellent taste and of creditable aspirations and his character as revealed in his correspondence is distinctly attractive. The greatest prose writer of the period was Tacitus, the historian. He had endured and been embittered by enduring the dreadful oppressions of Domitian's rule and under the liberal reign of Nerva and Trajan he used his opportunity to write truthful and independent histories of the empire. His style is individual and difficult from its condensation, but better suited to his subject than the Ciceronian periods would have been, and his treatment of his theme, though not free from prejudice, is extremely powerful. Herodotus and Thucydides in Greek and Livy and Tacitus in Latin are the four great historians of the ancient world.

On the side of poetry, though there were many writers of some merit, only a few deserve mention here. Martial composed epigrams, Lucan wrote an epic of the civil war between Cæsar and Pompey, and Persius and Juvenal were satirists. The latter is, in spite of rhetorical blemishes and a repellant savageness of tone, one of the greater writers in Latin literature and his satire has been the model for much writing of the same kind in English literature.

6. *The Later Empire.*— Of writers after the end of the first century of our era few are of importance from the strictly literary point of view and there is a certain justice in closing the history of Latin literature with Tacitus. But in the long list of writers of the next four or five centuries there are many whose works have, apart from their form, an intrinsic interest, in some cases a very great interest. From them may be selected the following names: In history, Suetonius, Ammianus, and the 'Scriptores Historiæ Augustæ'; in literary commentary and criticism, Gellius, Donatus, Servius, and Macrobius; in grammar, Marius Victorinus and Priscian. The most original and perhaps in a true sense literary work of these centuries is to be found in the legal writings, from Gaius to the 'Code of Justinian,' and in the Church Fathers, Lactantius, Ambrosius, Jerome, Augustine, and many others; in writers of both of these classes interest in the subject checked the prevalent inclination to regard the art of writing as an end in itself rather than as a means.

This chronological review of Roman literature may be supplemented by a brief summary and estimate of Latin writers by classes according to their form or subject-matter. In the comparative simplicity of the ancient literatures the connection between writers in the same class was more direct and therefore more noteworthy than it is in modern times.

The Roman drama, having been early checked in its possible growth by the introduction of Greek models, took almost entirely a Græco-Roman form. Of the tragedies nothing has been preserved except the book-plays of Seneca, and the writing of tragedy for the stage had come to an end before the time of Cicero. The form of drama which took its subjects from Roman legend appears to have been only slightly successful and it is evident that the serious drama had little hold upon Roman life. The comedies, even those of Greek form like the extant plays of Plautus and Terence, expressed more of the Italian spirit and retained their hold upon the stage, and the farces, the mimes, and the Atellan plays were even more popular. The Italian interest, then as now, was more in the acting and impersonation than in the dramatic form or story.

In epic poetry the glory of the Homeric poems was so great as to determine, somewhat to its disadvantage, the form of the Roman national epic. It is not unlikely that Ennius was in this respect more truly national than Vergil. The poet of the 'Æneid' was in truth hampered by the Homeric machinery of gods and heroes and by the supposed necessity of imitating in one part of his poem the wanderings of Odysseus, in another the battles of the Iliad. These things were not real to him; they were epic conventionalities which he felt obliged to adopt, as he adopted at times the phrases and the similes of the Homeric style. In all these respects, in which the 'Æneid' is most frequently and quite properly compared with the Greek epic, Vergil is plainly the inferior and they are sufficient to exclude him from the small company of the world's greatest poets. But in the occasional passages where he is inspired by the opportunity of expressing his real theme — the greatness of the Roman state — he writes with a proud dignity and a conscious understanding of the meaning of history, to which there is no parallel in the Homeric poems. His verse also is suited to the dignity of his thought; his hexameters are composed as wholes, while the Homeric hexameter appears to retain the traces of its composition out of two short half-verses. The Vergilian verse is less suited to the simplicity of narrative, but is unequaled in elevation.

Didactic writing in prose and verse was especially natural and attractive to the Roman mind and the series of didactic works extends from the earliest times down to the end. The most notable in verse are the great poem of Lucretius de Rerum Natura and the 'Georgics' of Vergil. Both depend largely — Lucretius wholly — on Greek authorities for their subject-matter, but two more thoroughly Roman poems could not be named. In form the work of Lucretius is incomplete; the 'Georgics' is one of the most perfectly finished poems in Latin literature.

Lyric poetry in Latin has an especial interest from the fact that the Greek lyrics of the best period are preserved only in fragments and our conception of this important form of poetry in ancient literature must be derived chiefly from Catullus and Horace. Apparently the best qualities of Alcæus and Sappho are better reproduced by the free spontaneity of Catullus than by the careful workmanship and mature intelligence of Horace. We are fortunate in the possession of both. Lucretius, Catullus, Vergil, and Horace are the four cornerstones of Latin poetry.

The elegy is closely allied to the lyric, from which it differs chiefly in the use of the elegiac couplet, hexameter and pentameter. The examples that we have in Tibullus, Propertius, and Ovid do not conform to the rule of ancient grammarians that elegy should deal with melancholy themes. But the somewhat despondent temperament of Tibullus and the simplicity of his treatment are well suited to elegy. Propertius is more virile, but is over-much given to the display of Alexandrian learning. In the amatory elegiacs of Ovid his extraordinary cleverness has a congenial field and his lack of essential manliness is less detrimental than elsewhere.

Epigram and satire were also natural forms of expression for the Italian, and many epigrams are extant in inscriptions or are preserved anonymously in the Anthology. Martial is the only writer whose collected epigrams have come down to us. They are often neat, often amusing, but this form of art is of course not very high. In satire the Romans claimed complete originality and apparently with justice. The satirical spirit may express itself in comedy or epigram or in semi-lyrical iambics like the 'Epodes' of Horace, but the grammarians meant that in Latin the satire had been given a distinct conventional form — a short poem in hexameters — in which was expressed a distinct tone of critical comment on persons or on social life. In this sense satire can be clearly traced from Lucilius through Horace to Persius and Juvenal. Of the four Horace is incomparably the most humorous and in reality the most penetrating; Lucilius is preserved only in fragments, Persius is obscure, and both the objects of Juvenal's satire and the indignation with which he attacks them are too real to give pleasure.

In the prose literature of Rome oratory and history hold the first place. In both the art took substantial form before the national tendency was overwhelmed by the finished Greek productions. Oratory is represented in the extant literature only by some late Panegyrics and the speeches of Cicero, a small amount in comparison with the volumes of the Attic orators. It is peculiarly unfortunate that we have none of the political speeches which played so large a part in the history of the republic; they would undoubtedly illustrate the prevailingly practical character of Roman oratory and would show how steadily it grew to the height of Cicero's 'Second Philippic.' Up to this point, while it was increasingly stimulated by the best Greek models, it was able to resist the influence of Greek rhetoric. After Cicero's time the teaching of rhetoric, which had become common in Rome, brought about an undue attention to form and a consequent loss of power.

The writing of history also long served a practical end. It began as a mere expansion of the official annual records, including the names of magistrates, the important public events and the recognized prodigies. This kind of history continued to be written after Naevius and Ennius had composed more elaborate histories in verse, and, even when Roman history was written in the Greek language, it was but little influenced by the great Greek models. It is with Sallust and Nepos that the writing of history really began and its importance in Latin literature is attested by the long line of minor historians.

Roman philosophy can make no claim to originality. It is found, in prose, in Cicero and Seneca. The former gave free renderings of the best Greek works on ethical philosophy with special reference to its value in the training of the orator; the latter wrote without much system brief essays on ethics.

Of epistolary literature, either letters actually sent to the persons addressed or essays in epistolary form, a considerable amount is known through allusions and the two collections by Cicero and Pliny have been mentioned. They are a unique feature of Roman literature, since it happens, perhaps from the concentration of Greek life in single cities, that no such collections are extant in Greek.

Of the technical writings enough has been said. They belong to all periods of the literature and cover almost all fields of study, agriculture, grammar, literary criticism, architecture, medicine, rhetoric, military strategy, engineering, astronomy, law; the first and the last subjects in this list being by far the most abundant and important.

In comparison with the Greek literature the Latin is inferior in imagination and in form — two important characteristics; it is superior in the directness of its human appeal and in its practical worth to the modern world. It is sometimes said to be an imitative literature, but it is rather a continuation of Greek literature in new surroundings. The influence of Greek literature upon Roman is not different in kind from the influence which modern literatures exert upon each other.

A comparison with modern literature is less easy, because the differences are greater. The ancient literatures follow more strictly defined lines of tradition, especially in poetry. The Roman circle of readers was more limited than the modern and literature was therefore less broadly based and less representative of a wide variety of interests. And the comparative absence of the romance or novel and the slight use of the motive of romantic love makes a very obvious difference.

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Latin Union, The. The institution of the Latin Union marks an important epoch in the history of bimetallism, for, while it was the gold discoveries of California and Australia which were the direct cause of the organization of this monetary convention, it was the downward tendency in the price of silver that resulted in the practical suspension of that coinage by the parties to the treaty.

In 1853, when the subsidiary silver of the United States had begun to be seriously affected by the cheapened price of gold, the treasury department of this country found it necessary to reduce the quantity of silver in its small coins in order that they might still remain below the value of gold. A few years passed, and Switzerland also found herself face to face with the same financial problem, but she, instead of following the example of the United States, solved her difficulty by lowering the fineness of standard for her small coins to 800 thousandths fine.

This method of equalizing the coinage naturally had a tendency to act disadvantageously for those countries like France and Italy, where the standard remained much higher than that of Switzerland, for, as the coins of one nation circulated commonly in all the countries that had adopted the franc system, it was soon realized that, in accordance with Gresham's law, the cheaper Swiss coins would eventually supersede the dearer coins. It was unreasonable to suppose that the coins of France or Italy, containing as they did so much more pure silver, could hope to compete with the cheap coins of Switzerland, so long as the latter passed current at the same nominal value.

Such was the fear, and it was not long before these predictions began to be fulfilled. The Swiss coins, being only 800 thousandths fine, soon crossed the French frontier, where they were exchanged for French coins of the same nominal value. The latter were then exported to Switzerland, where, after having been melted and recoined, they netted a considerable profit for the speculator. By April 1864 the situation had become so thoroughly unsatisfactory that the French government was compelled to issue a decree prohibiting the receipt of the Swiss coins at the customs-house and other public offices.

In response to overtures from Belgium a conference of delegates representing four of the interested states — France, Italy, Switzerland, and Belgium — met in Paris 20 Nov. 1865, and agreed to establish a uniform coinage, the new system to be based upon the principles adopted by the United States in 1853. Thus, the silver coins — the 2 franc, 1 franc, 50 centimes and 20 centimes pieces — were reduced from a standard of 900 thousandths fine to a uniform fineness of 835 thousandths, a policy which lowered the small coins of the several countries to the position of a subsidiary currency.

In adopting this policy the members of the Latin Union had not discarded the principles of bimetallism. Gold coins of the value of 100, 50, 20, 10, and 5 francs, and a 5-franc silver piece, were all to be coined at the old standard of 900 thousandths fine, and free coinage, at a ratio of 15½ to 1, was granted to any holder of gold or silver bullion who desired to obtain any of the gold coins or 5-franc silver pieces. The subsidiary currency was formally declared legal tender in all business transactions between individuals of the states that coined them for an amount not in excess of 50 francs.

The treaty under which the Latin Union was formed was ratified by each government, and went into effect 1 Aug. 1866. In 1868 Greece also became a party to the convention, which, by its own terms, was to exist until 1 Jan. 1880, but the downward tendency shown by silver during 1873 compelled the delegates to call another conference. On this occasion the fear most generally entertained was that the German mints would flood the several countries with their demonetized silver. A meeting was held at Paris, therefore, 30 Jan. 1874, at which the full power of free coinage of silver was withdrawn from individuals, and the amount of silver 5-franc pieces to be coined by the several treaty states was greatly reduced.

The last convention of the Latin Union was held 29 Oct. 1897, and the monetary agreement accepted at that time is tacitly continued from year to year, although it may be denounced at any time by any of the contracting states. According to its terms, the five contracting states have adopted a gold and silver coinage of the same fineness, weight, diameter, and current value, and the allowance for wear and tear in each case is the same. The coinage of 5-franc pieces, of gold as well as of silver, is temporarily suspended, and the issue of subsidiary silver is, with certain exceptions for special reasons, limited to 7 francs per head of the population of each state. The most important exception to this section of the convention is in the case of Greece, where the issue is limited to 6 francs per head.

It is further agreed between the contracting countries that each government, in all its public offices, shall accept payment in the silver 5-franc pieces of each of the other states, and in the subsidiary silver to an amount not in excess of 100 francs. Moreover, each state engages to exchange the excess of its issues over its receipts of subsidiary silver for gold or 5-franc silver pieces, and each binds itself that, at the termination of the convention, it will resume also its 5-franc silver pieces, paying in gold a sum equal to the nominal value of the coin resumed. The only exception to this section of the treaty is made in the case of Italy, in which the government is freed from this obligation to take back its fractional coins upon the dissolution of the convention, it being stipulated instead that it will forbid the exportation of such coins while the Union continues, and will not change its present system of subsidiary coinage for five years following its separation from the Union.

The following is a statement of the total issues of the five states as authorized by the last convention: France, 394,000,000 francs; Italy, 232,400,000; Belgium, 46,800,000; Switzerland, 28,000,000; and Greece, 15,000,000.

Latin Versions of the Scriptures. The origin of the Latin versions of the Bible is a subject which is involved in no little obscurity. Beyond the fact that (1) most of the New Testament books existed in Latin at the close of the 2d century; (2) many of the Old Testament books could then be read in that tongue, and (3) that these translations were the work of many authors, little, if any, information is obtainable. Moreover, as the most eminent scholars differ upon almost all the essential points that present themselves in this discussion, it is with difficulty that any of the important facts can be established. Wiseman, about 1830, announced the opinion that the Latin Church not only possessed but one version of the Bible prior to the time of Jerome, but that this version had been prepared in North Africa — not in Rome — and that it had subsequently been subjected to several revisions, for one of which Saint Augustine had been responsible. This was called 'Itala,' from the place in which it was made.

Pope Damasus, in the 4th century, requested Saint Jerome to prepare a revision. He began the work immediately, and in 383 the revised gospels made their appearance. In the same year he revised the rest of the Old Testament and made a cursory revision of the Psalms, using the Greek manuscript known as the LXX. This work, now known as the Roman Psalter, was followed, in 387, by a more careful revision of the Hexaplar text, and it is this work, called the Gallican Psalter, which is now in general use in the Roman Catholic Church.

The first revision of the work of Saint Jerome occurred in 802, when Alcuin revised the text from ancient Vulgate manuscripts, and subsequent revisions were made by Theodulf of Orleans (787–821); Lanfranc, afterward archbishop of Canterbury (about 1080); the Cistercian abbot, Stephen II. (1108); and Cardinal Nicholas (1150). In addition to these direct revisions different corporations issued 'Correctoria,' which contained discussions of the various readings. Among these were the 'Correctorium Parisiense,' which was approved by the archbishop of Sens; the 'Correctorium' of the Dominicans, prepared, about 1240, by Hugo a S. Caro, and a 'Correctorium' compiled by the Franciscans.

The revision of the Vulgate New Testament undertaken by Erasmus in 1516 lost much of its strength, owing to the fact that he had been actuated mainly by a desire to improve the style of the work, but really critical attempts to produce a purer Vulgate were made by Gumelli (Paris 1504), Castellaer (Venice 1511), and Laridius (Cologne 1530). Scholars place little importance upon either of these editions, but they admit that valuable efforts for the restoration of a critical text were made by Cardinal Ximenes in his 'Complutensian Polyglott (1502) and R. Stephens (1528). Many editions of Stephens' work were subsequently issued, and in 1540 the Theological faculty of Louvain entrusted the current edition to Henten of Malines that he might make a careful revision of the text. His first edition appeared in 1547, and was so correct in almost every detail that the edition of 1574, which was made, under the same authority, by Lucas of Bruges, was practically identical with Henten's 1547 text.

Careful as the various editors had been in the work of preparing their texts, there were differences in reading that called for an official edition, a want that was filled in 1590, when Sixtus V. issued a text which he ordered to be received as «true, lawful, authentic, and unquestioned.» Two years later the Sixtine Bible was followed by the Clementine edition, but as even this was not a perfect text of the Vulgate, the work of correction was continued, and for more than 40 years it went on almost without interruption, the most eminent scholars in the world having been summoned to participate in the revision.

Latin Writers. The following list of writers presents the more famous names which the general student of literature is likely to meet in his reading. The authors are arranged according to the year of their birth so far as it can be determined. See also Latin Literature.

Lucius Livius Andronicus. c. 284 — 204 B.C.
With his translations of Greek tragedy and comedy Latin literature is said to begin, 240 B.C. He also translated Homer's 'Odyssey.' We have a few fragments.

Gnaeus Naevius. c. 269 or 264 — c. 199 B.C.
Reckoned the first native Roman poet. He was the first to compose a Latin play. His greatest achievement was an epic on the Punic War. Only fragments survive.

Titus Maccius Plautus. c. 254 — 184 B.C.
Roman comic poet. Twenty of his comedies are still extant.

Quintus Ennius. 239 — 169 B.C.
The "Father of Roman Literature." Wrote tragedies and comedies, and other poetry. His chief work is an epic poem, 'The Annals,' covering the whole history of Rome.

Marcus Porcius Cato. 234 — 149 B.C.
Author of the first Roman historical work in Latin prose. He published orations and didactic treatises. His work on 'Agriculture' is the oldest volume of Latin prose extant.

Marcus Pacuvius. c. 220 — c. 132 B.C.
Roman tragic poet. His writings are now preserved only in fragments.

Publius Terentius Afer. c. 184 — 159 B.C.
Extant works, six comedies.

Gaius Lucilius. 180 — 103 B.C.
First Latin satiric poet. We have only fragments.

Lucius Accius. 170 — B.C.
Author of adaptations of Greek tragedies, original Latin tragedies, and various prose works. Fragments extant.

Marcus Terentius Varro. 116 — 27 BC.
Most learned of ancient Roman scholars. The major portion of his prose and poetry is lost, but we have considerable remains of his works on 'The Latin Language' and on 'Agriculture.'

Marcus Tullius Cicero. 106 — 43 B.C.
Of his numerous writings, we have over 50 orations, many rhetorical and philosophical treatises, and about 800 letters.

Gaius Julius Caesar. 100 — 44 B.C.
His memoirs, 'The Commentaries,' alone remain.

Cornelius Nepos. c. 99 — c. 24 B.C.
Author of biographies of many eminent men.

Titus Lucretius Carus. 96 (probably) — 55 B.C.
Famous for his didactic poem 'On the Nature of Things,' which we still have.

Gaius Valerius Catullus. 87 or 84 — c. 54 B.C.
First important and perhaps the greatest Latin lyric poet. We have a collection of over a hundred of his poems.

Gaius Sallustius Crispus. 86 — 34 B.C.
Best known by his monographs on Catiline's conspiracy and the Jugurthine war.

Publius Vergilius Maro. 70 — 19 B.C.
Most representative Latin poet. His greatest works are the 'Eclogues,' the 'Georgics,' and the 'Æneid,' but we also have some of his minor poems.

Quintus Horatius Flaccus. 65 — 8 B.C.
Left satires, epodes, odes, and epistles, but is most distinguished for the perfection of his odes.

Titus Livius. 59 B.C. — 17 A.D.
Wrote a history of Rome in 142 books, of which we have 35.

Albius Tibullus. c. 54 — c. 19 B.C.
An elegiac writer, from whose pen we have about two dozen poems.

Lucius Annaeus Seneca. c. 54 B.C. — c. 39 A.D.
Of his rhetorical works we have about six books.

Sextus Propertius. c. 49 — c. 15 B.C.
Elegiac poet, from whom we have four books of verse.

Publius Ovidius Naso. 43 B.C. — 17 or 18 A.D.
His important extant poems are the 'Art of Making Love,' 'Remedies for Love,' the 'Metamorphoses,' '*Epistulae ex Ponto,' Tristia, Fasti, Heroides.* A famous tragedy, the 'Medea,' has not survived.

Gaius Velleius Paterculus. c. 19 B.C. — 30 + A.D.
Author of a compendium of Roman history which is still extant.

Valerius Maximus.
We have his collection of anecdotes in nine books.

Lucius Annaeus Seneca. c. 4 B.C. — 65 A.D.
From him have come a satire on Claudius, moral essays, philosophical epistles, physical treatises, and a few tragedies.

Aulus Cornelius Celsus. c. 2 A.D. — ?
Author of an encyclopedic work, of which we have only the eight books on medicine.

Phaedrus.
Author of an extant collection of fables.

Pomponius Mela.
His geographical work in three books is the earliest work of the sort that we possess.

Lucius Junius Moderatus Columella.
Author of an important work in prose and verse on agriculture, in 12 books.

Quintus Curtius Rufus.
'History of Alexander the Great, in 10 books, all of which, except two, have survived.

Gaius Plinius Secundus. 23 — 79 A.D.
Author of the 'Historia Naturalis,' an encyclopedic work in 37 books, still extant.

Silius Italicus. c. 25 — c. 101 A.D.
Composed an extant epic poem on the second Punic war, in 17 books.

Aulus Persius Flaccus. 34 — 62 A.D.
Writer of six satires, still extant.

Marcus Annaeus Lucanus. 39 — 65 A.D.
Of numerous works in prose and verse we have only his epic, the 'Pharsalia.'

Petronius Arbiter. ? — 66 A.D.
Author of a satirical romance in at least 20 books, of which we have considerable fragments.

Titus Calpurnius Siculus.
Left us seven eclogues and a poetical panegyric.

Gaius Valerius Flaccus Setinus Balbus. — c. 90 A.D.
Composer of an extant poem on the Argonautic expedition, in eight books.

Marcus Fabius Quintilianus. Between 35 and 40 — c. 95 A.D.
Known chiefly by his treatise in 12 books upon the training of an orator.

Publius Papinius Statius. c. 40 — 96? A.D.
There have survived of his works five books of occasional poems (the 'Silvæ'), and two epics, a Thebaid and an Achilleid.

Marcus Valerius Martialis. c. 40 — c. 102 to 104 A.D.
The world's greatest writer of epigram, from whom we have 1,575.

Publius Cornelius Tacitus. c. 55 — c. 120 A.D.
One of the chief ancient historians. His surviving works are a treatise on oratory, a biography of Agricola, a monograph on Germany, his 'Annales' and 'Historiæ.'

Decimus Junius Juvenalis. c. 60 — c. 140 A.D.
Composed 16 poetical satires, which we have.

Gaius Plinius Caecilius Secundus. 62 — c. 113 A.D.
Of his published speeches only the panegyric of Trajan has reached us, but his nine books of letters in semi-essay form, and a tenth containing his correspondence with Trajan, have survived.

Gaius Suetonius Tranquillus. 75? — 160? A.D.
Latin biographer, best known by his extant 'Lives of the Cæsars,' although we have fragments of other biographies.

Lucius (?) Annaeus Florus.
Composed an extant epitome of Roman history in two books.

Marcus Cornelius Fronto. c. 100 — c. 175 A.D.
Besides less important works in incomplete form, we have most of his correspondence with Marcus Aurelius.

Gaius. c. 110 — c. 180 A.D.
The famous jurist, large amounts of whose writings have come down to us.

Marcus Aurelius Antoninus. 121 — 180 A.D.
Besides his letters in Latin, we have the well-known 'Meditations,' written in Greek, in 12 books.

Lucius Apuleius. c. 125 — ? A.D.
Composed works on a great variety of subjects, of which few have reached us. Most important is the novel 'The Golden Ass.'

Aulus Gellius. c. 130 — ? A.D.
His miscellanies, the 'Attic Nights,' in 20 books, have reached us almost intact.

Marcus Minucius Felix.
Author of a dialogue, the 'Octavius,' which is our earliest extant work in Latin Christian literature.

Quintus Septimius Florens Tertullianus. c. 150 — c. 230 A.D.
The great Christian apologist. We have numerous theological treatises from his pen.

Thascius Caecilius Cyprianus. c. 200 — c. 255 A.D.
Author of numerous theological works, many extant.

Marcus Aurelius Olympius Nemesianus.
We have a portion of his didactic poem on the chase.

Arnobius. ? — 326? A.D.
Author of a Christian apology in seven books, which have come down to us.

Lactantius Firmianus. — after 315 A.D.
Known as the Christian Cicero. We have his chief theological works in prose and verse. Most important is his 'Institutiones Divinæ.'

Eutropius. 4th century.
A historian whose epitome of the entire history of Rome, in 10 books, is still valued.

Hilarius (Bishop of Poitiers). — 367 A.D.
A Christian controversialist and commentator on the Bible, of whose numerous works we still have remains.

(Pope) **Damasus.** 305 — 384 A.D.
One of the first Christian poets. Epitaphs and poetical eulogies of departed Christians have come down to us.

Decimus Magnus Ausonius. c. 310 — c. 395 A.D.
A Roman poet from whom we have many works in various departments of literature, epigrams, elegiacs, epistles, etc.

Ammianus Marcellinus. c. 330 — c. 400 A.D.
Composed a continuation of 'Tacitus,' of which we have only 18 books of contemporary history.

Hieronymus. 331 — 420 A.D.
Famous for his translation of the Bible and his commentaries. A Latin version of Eusebius' Chronological Tables, many letters, and Christian biographies require mention.

Ambrosius. c. 340 — 397 A.D.
One of the Church Fathers. His writings include letters, orations, hymns, and didactic works, of which we have large amounts.

Quintus Aurelius Symmachus. c. 345 — c. 405 A.D.
Besides fragments of his orations, we have official reports, and 10 books of letters which are of great historical value.

Aurelius Prudentius Clemens. 348 — c. 410 A.D.
The greatest poet of his century. We have hymns and other Christian poetry.

Claudius Claudianus. ? — c. 408 A.D.
Last important non-Christian poet. Extant are historical and mythological poems and many shorter pieces. Most famous is his epic, 'The Rape of Proserpina.'

Meropius Pontius Anicius Paulinus. 353 — 431 A.D.
A Christian writer from whom we have letters and poems.

Aurelius Augustinus. 354 — 430 A.D.
Widely known by his 'Confessions,' he has also left us letters, sermons, theological treatises, and his famous work, in 22 books, on 'The Kingdom of God.'

Macrobius Theodosius. 4th/5th century A.D.
A commentary on Cicero's 'Dream of Scipio' and a book instructive to the student of Roman literature and antiquities, which he called 'Saturnalia,' have been preserved.

Martianus Capella. 4th/5th century A.D.
We have his encyclopedic work, in nine books, on the 'Seven Liberal Arts,' which was of great importance in mediæval education.

Leo (the First, surnamed "the Great"). c. 395 — 461 A.D.
Sermons and letters of his composition are extant.

Gaius Sollius Apollinaris Sidonius. c. 430 — c. 480 A.D.
A collection of his poems and nine books of letters are instructive for the life of his time in Gaul.

Blossius Æmilius Dracontius. 5th century A.D.
We have from him poems that are very creditable for this age, on mythological and Christian subjects, as well as two epithalamia.

Magnus Felix Ennodius. 473 — 521 A.D.
A prolific writer in several fields, whom we know through his letters, speeches, a panegyric, and numerous poems.

Anicius Manlius Torquatus Severinus Boethius. c. 480 — 524 A.D.
Translator of many Greek philosophical and mathematical books. His famous 'Consolations of Philosophy' is often accounted "the last work of Roman literature."

Flavius Magnus Aurelius Cassiodorus Senator. c. 480 — c. 575 A.D.
Historical, theological, and encyclopedic works, a considerable portion of which has survived.

Priscianus. 6th century A.D.
Besides some unimportant works, we have his eight books on the Latin language, the most influential grammatical work in that tongue.

Venantius Honorius Clementianus Fortunatus. c. 535 — c. 600 A.D.
Best known through his epic poem on Saint Martin of Tours, although others have come down to us, together with lives of the Saints in prose.

Gregorius of Tours. 538 — 593 A.D.
Author of theological books, including lives of the Saints. Most important to us is his 'History of the Franks' in 10 books.

(Pope) **Gregorius** (the First). c. 540 — 604 A.D.
We have theological works composed by him, and over 800 letters of high value to the historian.

Isidorus (Bishop of Seville). c. 570 — c. 636.
A theological, historical, and grammatical writer of great influence upon the Middle Ages. Chief among the works which we have from him is his 'Origines,' in 20 books.

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Latins (*Latini*), the ancient inhabitants of Latium, in Italy. Janus, Saturn, Picus, and Faunus, who were deified by their subjects, are represented to have been the most ancient Latin kings. These ancient Latins formed a league of 30 cities, of which the town of Alba Longa became the head. Although Rome was a colony from Alba she became powerful enough in the reign of her third king, to seize upon that city, and raze it to the ground. Under Servius Tullius, Rome entered the Latin confederacy, and in the reign of his successor, Tarquinius Superbus, was acknowledged as head of the league. On the fall of the Tarquins the Latins regained their independence, and struggled long against the republic to maintain it; it was finally lost, however, by the decisive victory of the Romans near Mount Vesuvius (340 B.C.).

Lat'itude, a term used in astronomy and geography. The geocentric latitude of a heavenly body is its angular distance from the ecliptic, as seen from the earth's centre; its heliocentric latitude is its angular distance from the ecliptic, as seen from the sun's centre. The geographical latitude of a place is the altitude of the celestial pole above the horizon; or it is the arc of the celestial meridian intercepted between the zenith and the equator; its geocentric latitude is the angle at the earth's centre intercepted between the place and the terrestrial equator. To determine geographical latitude, the altitude of the pole is found indirectly from observations of a circumpolar star, or from meridian altitudes of the sun or known stars. At sea the sun's meridian altitude is observed with a sextant, its declination being given in the astronomical ephemeris. See also LONGITUDE.

Latitudina'rian, a term applied to those English divines of Charles II.'s time, who, from opposing strenuously both the High Church party and that of the Dissenters, incurred the enmity of both. It denotes one who commends or sanctions deviations from the strict principles of orthodoxy, and it is frequently used as a term of reproach.

Latium, lā'shĭ-ŭm, a name given to the residence of the Latins, in Central Italy, on the Tyrrhenian Sea, extending between Etruria and Campania. In the earliest times there was a large laurel grove situated on the coast, at the mouth of the Tiber, which extended as far as the city of Laurentum, to which it gave name. Farther on lay the little river Numicus and the sources of the Juturna; and still farther to the east was situated the city of Lavinium. Ancient Latium was much more thickly peopled and much more highly cultivated than the present Campagna di Roma, to which it pretty nearly corresponds; and it must have been healthier, though it was always considered an unhealthy region.

Latona, lā-tō'na̦, was the mother of Apollo and Artemis. During her pregnancy she was persecuted by Hera, by whose command the dragon Python threatened her with death, and the earth was not permitted to allow her a place for her delivery. After long wanderings she found rest on the floating island of Delos. The giant Tityus having attempted to offer her violence, was killed by Apollo and Artemis. Latona is represented as a mild, benevolent goddess, in a sea-green dress. With Artemis she cured the wounded Æneas, and crowned him with glory. When Artemis fled to Olympus from the anger of Hera, Latona carried to her her quiver and arrows, which she had left behind. She was worshipped chiefly in Lycia, Delos, Athens, and other cities of Greece. In Crete a festival was celebrated in honor of her, called *Ecdysia.*

Latour d'Auvergne-Corret, Théophile Malo de, tā'ō-fēl mä'lō dė lä-toor dō-värn-yē-kor-rā, French soldier: b. Carhaix, Brittany, France, 23 Nov. 1743; d. Oberhausen, Bavaria, 27 June 1800. He early decided to become a soldier, and when the French Revolution broke out was among the first to rally round its standard, and distinguished himself in the army of the Pyrenees. Higher appointments were offered him but he declined, declaring that he was only fit to command a company of grenadiers, and was consequently named by Napoleon «First Grenadier of France.» His corps generally made the vanguard, and was called «the infernal column.» In 1799 he fought under Massena in Switzerland, and fell while attached to the army of the Rhine. His heart was embalmed and carried in a silver box by one of the company in which he had served; his name was always called, the oldest sergeant answering — «Died on the field of honor.» As an author he made himself known by a singular work on the early history of Brittany, entitled, 'Nouvelles Recherches sur la Langue, l'Origine, et les Antiquités des Bretons' (1792).

La Trappe, lä träp, the name of a Cistercian abbey founded by Count Rotrou of Perche in 1140. It was known as Notre Dame de la Maison Dieu and from its situation in a damp unhealthy glen, accessible only by a narrow stony passage was called La Trappe («the trap»). The monks were as distinguished for austerity during the 14th and the 15th century as they subsequently became for licentiousness and violence when they were known as the «Bandits of La Trappe.» The monastery, however, passed into the hands of Armand Jean le Bouthilier de Rancé in the middle of the 17th century. This brilliant abbot had early abandoned himself to wordliness, but became converted, introduced Benedictine monks into La Trappe and enforced severe discipline. The brethren rose at 2 A.M., retired at 7, slept on straw, were forbidden wine and flesh, spent each evening some time in digging their own graves, and never spoke excepting to say to each other, «Memento mori.» Rancé discouraged literary pursuits but enforced constant manual labor; he died in 1700, and the Trappists were driven out of France by the Revolution. They founded a house at Valsainte, Switzerland, which was destroyed by the French in 1798, but they were again put in possession of La Trappe on the Restoration of the Bourbons. In 1829 the Trappist houses were closed by a royal decree, and all but nine monasteries were suppressed; these, however, were compelled to seek refuge in Algiers 1844, and the United States in 1848, where they established houses in Kentucky and Iowa. Consult: Gaillardin, 'Les Trappistes ou l'Ordre de Citeaux au XIX. Siècle, Histoire de la Trappe depuis sa Fondation' (1844).

Latrobe, la̦-trōb', **Benjamin Henry,** American architect: b. Yorkshire, England, 1 May 1764; d. New Orleans 3 Sept. 1820. He studied at the University of Leipsic, served in the Prussian army as cornet of hussars (1765–8), became an architect in England, in 1798 was appointed engineer of London, and came to Norfolk, Va., in 1796. He built the James

River-Appomattox canal and the Richmond penitentiary; removed to Philadelphia, and there designed the bank of the United States, the bank of Pennsylvania, the old Art Academy and other structures; and supplied the city with Schuylkill water in 1800. The Roman Catholic Cathedral at Baltimore is also his work. In 1803 he was appointed surveyor of public buildings in Washington, and later was chosen architect of the Capitol. He effectively introduced the natural products of the States as architectural features, particularly in the corn-stalk pillars with capitals of the ears. After the burning of the capital by the British in 1814, he was appointed to rebuild it, but in 1817 resigned.

Latrobe, John Hazlehurst Bonval, American lawyer: b. Philadelphia 4 May 1803; d. Baltimore 11 Sept. 1891. He was the son of Benjamin H. Latrobe (q.v.). He studied at the United States Military Academy, was called to the bar in 1825, from 1828 until his death was counsel for the Baltimore & Ohio Railway Company, was the founder of the Maryland institute, invented a stove commonly known as the «Baltimore heater,» was long identified with the American Colonization Society, and succeeded Henry Clay in its presidency in 1853. He also became president of the Maryland Historical Society, and published a 'Biography of Charles Carroll of Carrollton' (1824), a 'History of Mason and Dixon's Line' (1854), 'Personal Recollections of the Baltimore & Ohio Railroad' (1858), and other works.

Latrobe, Pa., town and borough in Westmoreland County, on Loyalhanna Creek and on the Pennsylvania railroad, 40 miles east of Pittsburg. It is the centre of a large agricultural district. There are valuable deposits of coal and iron ores and mining is carried on to a considerable extent. Latrobe has a large number of manufactories, including steel works, cork works, paper, flour and lumber mills, glass-houses, brick-yards, etc. Pop. (1900) 4,614; (1903) 5,000.

Latro'bite, a mineral named after C. I. Latrobe. It is found massive and crystallized in forms belonging to the triclinic system; but the crystals are not well defined; color, pale pink; scratches glass; specific gravity, 2.8; opaque; lustre vitreous. It is composed of silica, alumina, and lime, being a rare variety of anorthite (q.v.) or lime feldspar. See FELDSPARS.

Latrodec'tus, a genus of spiders of the loose-web building family *Theridiidæ*, which contains certain large American species popularly considered poisonous, especially one (*L. mactans*) known in the tropics as the katipo. This spider, according to Emerton, is sometimes half an inch long, with a round abdomen and the whole body black except a bright red spot on the under side and one or more red spots over the spinnerets and along the middle of the back; the small and few males have in addition red vertical stripes on each side. This spider makes a large funnel-shaped nest among loose stones, which may spread out two or three feet. It is found all over the country from Canada to Argentina and Chile, and is everywhere feared, but there is no good reason for considering it any more poisonous than other spiders. Consult: Emerton. 'The Common Spiders' (1902).

Lat'ten, a species of brass used in the Middle Ages for metal work. Mines of latten are mentioned as existing in the time of Henry VIII., and the metal is often alluded to in ancient public records, without students of antiquity being able to determine what metal is meant. Three varieties were distinguished, the *black*, the *shaven*, and the *roll*. That used by English workmen used to be imported from Germany and the Netherlands, the finest kind being known as Cologne plate. Latteners formed one of the recognized crafts of London. In some localities the term is still applied to plate-tin.

Latter Day Saints, The Reorganized Church of Jesus Christ of (anti-polygamist), a continuation of the Church which was organized at Fayette, N. Y., 6 April 1830, with six members. This organization was effected by Joseph Smith, Oliver Cowdery and others. Joseph Smith, who was chosen president, was born at Sharon, Vt., 23 Dec. 1805. Subsequently with his parents he removed to Palmyra, N. Y., where, on the occasion of a religious revival in 1820, while alone at prayer he was visited by a heavenly personage who forbade him joining any of the churches in the neighborhood, as their creeds were all wrong. On the night of 21 Sept. 1823 he was again visited by the angel who told him of gold plates containing an account of the former inhabitants of America, which, with the Urim and Thummim, were buried in a hill near by. He visited this place but was forbidden to remove them at that time. Exactly four years later he was allowed possession of them. With the aid of Oliver Cowdery and others as scribes, and the use of the Urim and Thummim, he completed the translation of the plates, or Book of Mormon, by June 1829. March 1830, three witnesses, Oliver Cowdery, David Whitmer and Martin Harris, were permitted to see and examine the plates. They signed a statement that the voice of God to them declared the record true. Eight other witnesses saw and handled the plates. All these witnesses continued to bear this testimony until death.

From the time of organization the church rapidly increased. In January 1831, the headquarters were established at Kirtland, Ohio; and in the following year a great many located in Jackson County, Missouri, which was appointed the place of Zion. Here they were persecuted and mobbed; and in the fall of 1833, driven from their homes by violence. Three years later, the exiles from Jackson County, joined by the Saints from Kirtland and the east, located in Caldwell County. In 1838 a religious persecution resulted in imprisoning the leaders and driving the body of the Church from the State. In the spring of 1839, no charges having been sustained against the leaders, they were permitted to escape, and soon joined the body of the Church near Quincy, Ill. They purchased the town of Commerce, afterward called Nauvoo, and rapidly gathered there. For five years they enjoyed comparative peace and prosperity.

On 27 June 1844, the Prophet Joseph Smith, and his brother Hyrum, were murdered by a mob at Carthage, Ill. This threw the Church into much confusion. The membership at this time numbered about 150,000. The quorums were as follows: (1) The First Presidency, consisting of the President and two counsellors, organized in 1833; (2) The Twelve Apostles organized in 1835, consisting at Joseph Smith's death of Brigham Young, president, Heber C. Kimball, Orson Hyde, Orson Pratt, William Smith, Parley P. Pratt, John Taylor, John E. Page, Wilford Woodruff, Willard Richards, George A. Smith, and Lyman Wight; (3) Seventies, composed of one or more quorums of missionaries of 70 men each, organized in 1835; (4) High Priests, a quorum without definite number, composed of local presidents; (5) Elders, organized into quorums of 96 each. Quorums of priests, 48 each; teachers 24 each; and deacons 12 each. The first bishop was Edward Partridge, ordained in 1831. He died at Nauvoo in 1840 and was succeeded in January 1841, by George Miller, who was acting in 1844.

The question now was, who should succeed Joseph Smith. The prophet himself had chosen and designated his son Joseph; but he, being only 12 years of age, a number of aspirants came forward, the more important being Sidney Rigdon, the only surviving member of the First Presidency; James J. Strang; William B. Smith, one of the Apostles, who, as brother of the prophet, claimed to be guardian for young Joseph, son of the prophet; and Brigham Young, who, together with eight other apostles, claimed the right of the Twelve to lead the Church. Young had the largest following; and in 1846 left Nauvoo for the West. (See MORMONS.) While at winter quarters near Council Bluffs, Iowa, in December 1847, he assumed the presidency of the Church, and led his followers to Salt Lake Valley, where he introduced such doctrines as Adam-God, blood atonement, and polygamy. None of these had been accepted by the Church, or taught by its authorities during the life of Joseph Smith.

In 1851, a number of persons and local organizations, some of whom had stood aloof from all factions, started a movement that resulted in a conference at Beloit, Wis., June 1852. This conference renounced all allegiance to Young, William Smith, Strang and others. At a conference 6 April 1853, seven apostles were chosen. Jason W. Briggs was chosen president and representative of the lawful heir in the presidency. Other officers were chosen, and thus the reorganization of the original Church was inaugurated. At a conference at Amboy, Ill., 6 April 1860, Joseph Smith, eldest son of the Prophet, accepted the presidency of the Church. 'The Saints' Herald,' the official publication of the Church, was commenced 1 Jan. 1860, at Cincinnati, Ohio. It was removed to Plano, Ill., March 1863. Since 1881 it has been published at Lamoni, Iowa. Joseph Smith has been its editor-in-chief since 1865. The Church held annual and semi-annual conferences until and including 1882, when the semi-annual were discontinued. The headquarters were at Plano, Ill., from 1863 to 1881; since then at Lamoni, Iowa. The quorums of the reorganization are organized in the same order which existed at the death of Joseph Smith. The doctrines are the same as promulged during his life, as follows:

> A belief in God the Eternal Father, his Son Jesus Christ, and the Holy Ghost.
>
> That men will be punished for their own sins, and not for Adam's transgression.
>
> That all men may be saved by obedience to the laws and ordinances of the gospel, namely, faith in God and the Lord Jesus Christ; repentance; baptism by immersion for the remission of sins; laying on of hands for the gift of the Holy Ghost; the resurrection of the body; that the dead in Christ will rise first; that men shall be judged, rewarded, or punished, according to the degree of good or evil they shall have done.
>
> That a man must be called of God, and ordained by the laying on of hands of those who are in authority, to entitle him to preach the Gospel, and administer in the ordinances thereof.
>
> In the same kind of organization that existed in the primitive Church.
>
> That in the Bible is contained the word of God, so far as it is translated correctly. That the canon of Scripture is not full, but that God, by His Spirit, will continue to reveal His word.
>
> In the powers and gifts of the everlasting gospel, namely, the gift of faith, discerning of spirits, prophecy, revelation, healing, visions, tongues, and the interpretation of tongues, wisdom, charity, brotherly love, etc.
>
> That marriage is ordained of God; and that the law of God provides for but one companion in wedlock, for either man or woman, except where the contract is broken by death or transgression.
>
> That the doctrines of a plurality and a community of wives are heresies. The Book of Mormon says: "Wherefore, my brethren, hear me, and hearken to the word of the Lord: For there shall not any man among you have save it be one wife, and concubines he shall have none.
>
> That the religion of Jesus Christ, will, if its precepts are accepted and obeyed, make men and women better in the domestic circle, and better citizens, and consequently better fitted for the change that cometh at death.
>
> That men should worship God in "Spirit and in truth;" and that such worship does not require a violation of the constitutional law of the land.

The Church has been more aggressive in its fight against the crime of polygamy than any other organization. The local work is divided into the following organizations according to reports of 1903: Two States, Lamoni, Iowa; and Independence, Mo.; both organized in 1901; 74 districts; 62 in the United States, 2 in Australia, 5 in England, 2 in Wales, 2 in Canada, and 1 in Nova Scotia. The reorganization supports Graceland College and a home for the aged, both at Lamoni, Iowa. The reorganization has a membership of about 50,000. It is prosecuting missionary work throughout the United States, the Canadas, Australia, New Zealand, Society Islands, Sandwich Islands, the British Isles, Scandinavia and other countries.

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By H. H. SMITH.

Latticeleaf, lăt'ĭs-lēf, or **Lattice-plant** (also called laceleaf and water-yam), a remarkable aquatic plant (*Aponogeton fenestralis*) of Madagascar, noteworthy for the structure of its leaves. The blade resembles latticework or open needlework, the longitudinal ribs being crossed by tendrils, and the interstices between them being open. The root, which is fleshy, and resembles that of the yam, is farinaceous and edible.

Laud, lâd, **William**, English prelate: b. Reading, Berkshire, 7 Oct. 1573; d. London 10 Jan. 1645. He was educated at Oxford; took priest's orders in 1601; became vicar of Stanford, Northamptonshire, 1607, and rector of West Tilbury, Essex, 1609; was made archdeacon of Huntingdon in 1615 and dean of Gloucester 1616, and as king's chaplain in 1617 accompanied James I. to Scotland, where he attempted to enforce Episcopacy with no success. In January 1621, he became a canon of Westminster and in the following June bishop of St. David's. After the accession of Charles I., Laud was translated in 1626 to the see of Bath and Wells, and in 1628 to that of London. In 1630 he was elected chancellor of the University of Oxford, which he enriched with a valuable collection of manuscripts, establishing also a professorship of Arabic. In 1633 he was promoted to the see of Canterbury. In 1634 he instituted rigorous proceedings against all who would not conform to the Church of England, and sought to extinguish all forms of dissent by means of fines, imprisonment, and exile. When the Long Parliament met (1640) the archbishop was impeached for high treason at the bar of the House of Lords by Denzil Holles and committed to the Tower. After three years he was brought to trial, but the lords deferred giving judgment. The House of Commons, however, passed a bill of attainder (January 1644), declared him guilty of high treason, and condemned him to death. He met his end on the scaffold at Tower Hill with great firmness. Consult: S. R. Gardiner, ‘The Personal Government of Charles I.’ (1871), and ‘The Fall of the Monarchy of Charles I.’ (1881); and ‘Lives’ by Hutton (1885); Benson (1887); Simpkinson (1894).

Laudanum, lâ'dạ-nŭm. See OPIUM.

Laudonnière, René de, rė-nā dė lō-dŏ-nē-ãr, French navigator. Nothing is known of the date of his birth or death. His first appearance is in 1562 when he shared in Ribault's attempt to establish a Huguenot colony at Port Royal in South Carolina. He built a fort and founded a colony in 1564 at a point 12 miles up the Saint John's River, Florida. But his colonists were more men of adventure than of industry and were much molested by the Indians. They eventually compelled him to sanction an expedition against the Spaniards in Cuba. But the colony fell subsequently into such straits that 3 Aug. 1565, when Capt. John Hawkins reached Fort Carolina, as they had named their settlement, he found them without supplies or ships. On 29 August Ribault arrived with seven ships and 300 men, and superseded Laudonnière, who was ordered home to defend himself against charges of treason and tyranny. In Ribault's absence the Spaniards attacked Fort Carolina and massacred the colonists. Laudonnière escaped, took refuge in England, and did not return to France till 1566.

Laughing Gas, a name given to nitrous oxide after its remarkable physiological effects were discovered by Sir Humphry Davy in his ‘Researches,’ published in 1800. The effects are generally of a pleasurable kind, and the person under the influence of the gas is more or less excited, dancing, singing, laughing, or indulging in other violent motions. This by prolonged inhalation ceases, and stupor and anæsthesia, or insensibility to pain, supervene. Hence the use of this gas in dental and surgical operations. See ANÆSTHETICS.

Laughing Jackass, the jackass-kingfisher (q.v.).

Laughing Philosopher, a characterization of Democritus of Miletus (q.v.). He laughed at the follies of man, and is distinguished by this epithet from the “weeping philosopher,” Heraclitus, who mourned for human depravity and infatuation.

Laughlin, lăf'lĭn, **James Laurence,** American political economist and educator: b. Deerfield, Ohio, 2 April 1850. He was graduated from Harvard in 1873. In 1878 was appointed instructor of political economy there and was assistant professor 1883-7. From 1887 to 1890 he was president of the Manufacturers' Mutual Insurance Company of Philadelphia; in 1890-2 professor of political economy at Cornell; and in 1892 became head professor of the same department in Chicago University. In later years he has given special attention to the study of financial questions; in 1894-5 he prepared a scheme of monetary reform for the San Domingo government which was later adopted; and he has been a member of the monetary commission created by the Indianapolis Monetary Conference in 1897. He is a member of the International Institute of Statistics and of the Political Economy Club, of which he was one of the founders. He has written: ‘Anglo-Saxon Legal Procedure in Anglo-Saxon Laws’ (1876); ‘Study of Political Economy’ (1885); ‘History of Bimetallism’ (1886), a comprehensive treatment of the subject; ‘Elements of Political Economy’ (1887); ‘Gold and Prices since 1873’ (1887); ‘Facts about Money’ (1895); ‘Report of Monetary Commission’ (1898); ‘Principles of Money’ (1902); ‘Reciprocity’ (1903); and has prepared an abridged edition of Mill's ‘Principles of Political Economy’ (1884) with a short biography and a sketch of the history of political economy. He is editor of the ‘Journal of Political Economy,’ and was one of the founders of the ‘Quarterly Journal of Economics’ to which he has contributed frequently.

Laughter, a movement of the muscles of the face, correlated with other movements of the entire body, usually indicative of mirth or happiness. The expression of laughter is not always indicative of a psychical appreciation of enjoyment, for it is well-known that idiots are prone to laughter which is often without any such significance. Many idiots constantly show a laughing countenance, the smile being more or less stereotyped; or they may grin, giggle, or chuckle at the slightest stimulus, whether of food, color, music, or personal contact. It is probable that in such cases laughter is purely an expression of physical contentment, rarely associated with higher or more complex ideas.

In children, laughter is more sensible, but the expressions of joy usually contain an element of uncontrolled exuberance. Thus they clap their hands, stamp their feet and jump around in pure excess of vital spirits. In adults the subject of laughter is extremely complex. As a rule, during laughter, the mouth is more or less open, the corners being drawn backward and usually somewhat upward. The upper lip is commonly raised. The drawing-back movement is seen best in the broad smile, or in moderate laughter; in out-and-out mirth the teeth are usually exposed by the raising of the upper lip. The cheeks are ordinarily drawn upward at the same time, and wrinkles are formed under the eyes. This movement in old persons makes a very characteristic feature, and the wrinkles so frequently found in their faces largely assist to interpret the sense of contentment indicated. Associated with laughter, there is often a change in the character of the eye. The bright and sparkling eye described by

Darwin and others who have devoted much time to this subject is the eye of laughter. Often tears suffuse the eyes and destroy this appearance of brightness, but this is usually due to excessive laughter.

Numerous signs are produced during these expressions of joy. During laughter, the movements of the chest and larynx are almost exactly opposite to those that accompany the screams and cries of distress. In these latter the expirations are prolonged and continuous, and the inspirations short and interrupted; whereas in joy the expirations are usually short and the inspirations long.

«In all races of men,» says Darwin, «the expression of good spirits seems to be the same, and it is easily recognized»; and he adds that «from the natives of New Zealand to the highly civilized Caucasian, much the same forms of emotional expression are to be observed.» Laughter is often an indication of general character; it is seldom two persons laugh exactly alike; and the study of laughter becomes a study of muscular movements. The «spontaneous, hearty laughter of sincere feeling is very different from the affected and constrained laughter of insanity.» Moreover, there are laughs which betoken peculiar constitutions of mind and character; laughs that are mechanical, nervous spasms, expressing nothing and expressed when there is nothing to laugh at, or perhaps something not to laugh at; laughs which, when they have not been acquired and are unconsciously formed, are signs of neurotic instability, but sure signs of guile when they are affected and consciously used — untrustworthy, anyhow, as laughter. Maudsley describes what he terms a «*quasi*-pathological laugh,» which is the abortive and incoherent laugh of the person of insane temperament, which is laughter pulled up abruptly, followed by a sudden facial seriousness, or a change which affects only a part of the features, while the rest are unmoved. Consult: Darwin, 'Expression of the Emotions in Man and Animals' (1892); Hughes, 'Die Mimik des Menschen' (1900).

Laugier, Paul Auguste Ernest, French astronomer: b. Paris 1812; d. 1872. He studied at the Polytechnique and at the Paris Observatory under Arago. In 1843 he was elected to the Academy of Sciences, and was afterward attached to the Bureau of Longitudes. He was favorably known for his work on the subjects of solar equator and sun-spots.

Laumontite, lâ'mȯn-tīt, one of the zeolite family of minerals. It usually occurs in masses made up of white, vitreous to pearly, monoclinic prisms. It is a hydrous silicate of aluminum and calcium, $H_4CaAl_2Si_4O_{14} + 2H_2O$. Upon exposure the normally colorless and transparent crystals quickly lose part of their water of crystallization and become white, opaque, brittle and much below the normal hardness of 3.5 to 4. Laumontite is rarer than most of the zeolites with which it is associated in many localities. Especially fine specimens are found at Nagyag, Transylvania, in Nova Scotia, New Jersey, Lake Superior, etc.

Laun, Friedrich, the pseudonym of the German novelist Friedrich Schulze (q.v.).

Launceston, läns'tȯn, England, a borough and market town in the county of Cornwall, 24 miles north by west of Plymouth, and 2 miles west of the Tamar. It is situated on the side of a hill, is generally well built, and has a fine church, built of granite in the 16th century and restored in 1852; several chapels; a guildhall in castellated style; a masonic hall; a town-hall (1887); excellent market-places; a grammar, national and board schools. There are ruins of the old castle, and of a fine priory. Agriculture, tanning, and iron-founding are the chief employments. From 1832 till 1885 Launceston returned a member to Parliament, and before 1832 it was represented by two members. This town was long the capital of Cornwall; but Bodmin is now the assize town. It gives name to one of the six parliament divisions. Pop. (1901) 4,053.

Launceston, Tasmania, city in the county of Cornwall, 133 miles north of Hobart, at the confluence of the North and South Esk rivers, the united stream taking after this the name of the Tamar, which is navigable up to the town from the sea, a distance of 40 miles. The streets are regularly laid out and lighted by electricity. The principal buildings are the town-hall; the Albert Hall; the mechanics' institute, with library; a Church of England grammar-school; Wesleyan Ladies' College; a convent school, and other educational institutions; a new post-office; a custom-house; a museum and art gallery; the Academy of Music; military barracks; jail and court-house; hospital, etc. Wheat, oats, peas, and potatoes are the chief crops grown in the neighborhood, but fruit culture is steadily extending. Pop. (1891) 17,208; (1901), with suburbs, 20,358.

Launch, (1) in ship-building, a term comprehending the apparatus for launching a ship. (2) The largest boat belonging to a ship of war. It is only used for service which cannot be performed by the smaller boats, being hoisted on board and kept on deck just abaft the foremast, where it serves as a receptacle for lumber and stores. In large men-of-war the launch is sometimes decked over, and is capable of mounting several light guns. The corresponding boat of merchant vessels is called the long boat. The launch is from 30 to 40 feet long, having a beam from .29 to .25 of its length. It has 10 or 12 oars, and is carvel-built.

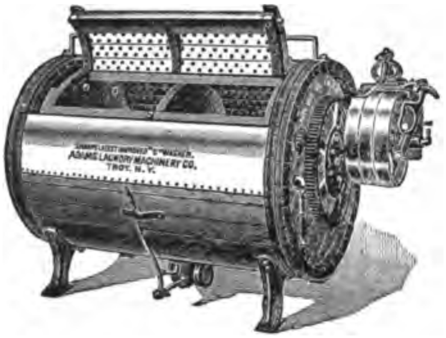
Launder, in mining, a wood water-gutter or pipe. A trough for conveying water to a stamp-mill or other hydraulic apparatus for comminuting or sorting ore. Also a trough or box to receive the slimes from the stamps.

Laundry Machinery. Laundry machinery as it is understood from the commercial standpoint, includes a class of mechanical devices developed during a comparatively recent period, to supplant the primitive processes of laundering that have existed during all time. While the use of laundry machinery in crude forms dates back for a considerable period, the past three or four decades mark the era of the development and manufacture of power machinery for laundering purposes, in a sufficient degree to warrant recognition as an independent branch of industry. This is due to the fact that the steam laundry is a modern institution; and the development and extent of manufacture of laundry machinery has gone hand in hand with the growth of the laundry interest. The steam laundry of to-day performs on a large scale, and by improved mechanical devices, the processes of cleansing, that for centuries had been confined to hand work in connection with the running stream, or the wash tub of later years. The growth of the laundry as an organized business has been so rapid during the past quarter of a century, that its changing needs have made, and still keep, the invention and production of laundry machinery in a state of constant development of new ideas and forms. So that while the laundry machinery business has passed the embryotic stage, it may fairly be said in the opening years of the 20th century to be in an era of great advance, holding and to hold a much more important position as an independent and recognized branch of mechanical industry. The city of Troy, N. Y. (the birthplace of the collar, cuff and shirt industry, as set forth in an article under that head) was practically the home, and for many years was the centre, of the steam laundry interests of the country; an interest which has now extended to every city or place of any importance in the land. So general is the recognition of this fact, that the name «Troy Laundry» is still retained by hundreds of laundries in various parts of the United States, and is even seen abroad. It was natural, therefore, that the earliest organized movement to produce the machines demanded for laundering purposes should have been made in Troy. That city has always been and still remains a strong factor in the laundry machinery industry, which, however, with its diversified and growing interests is now located and strongly intrenched in various sections. All the manufacturies of laundry machinery are, however, located east of the Mississippi River.

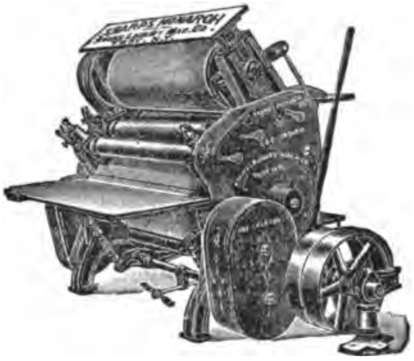
The introduction, use and development of laundry machinery has been much more rapid and general in the United States than in Europe. American manufacturers are competing actively for the trade of all foreign markets. The greatest limitation to the development of the trade abroad is the conservatism of foreign nations in adopting the more advanced methods of laundering calling for the modern types of American machinery. While there are very many forms of laundry machinery in use, the most prominent examples of the art are included in those that perform the three most important functions of laundering, namely washing, drying and ironing.

Washing Machines.— The first process, washing, is performed by two types of machines, the dash wheel and the reverse wheel. The dash wheel consists of a large cylinder divided into pockets by partitions and revolving in one direction inside of an outer case. This machine is used principally in new work laundries. The more generally used washer is the reverse wheel. In this the goods are placed in an inside cylinder having perforations to admit the free passage of water, steam and soap among the goods. This cylinder runs in an outside shell or case, the water and steam being let in by pipes, and by automatic reversing devices the inside cylinder revolves several times in one direction, then an equal number in the opposite one. This action loosens up the goods and subjects them freely to the action of water and soap, and so removes the dirt from the garments. The inside cylinders are made of wood or brass and the outside cases of wood, galvanized iron or brass.

Drying Machinery.— The next process is that of drying. The goods are first taken from the washer and placed in what is known as a wringer or centrifugal extractor. This machine consists of a perforated copper basket, revolving rapidly inside an iron or steel curl or case, and making from eight to fourteen hundred revolutions per minute. The water is thrown out through the perforations in the basket by centrifugal force, and in about twenty minutes the goods are ready to be taken out partially dried. The drying process is completed by the use of a dry-room. The improved types include the cabinet room, made up of a series of racks or trucks arranged with bars or hooks to hold the collars, cuffs, shirts or other garments, and running on tracks into a cabinet made of wood or metal. The heat is supplied by a series of steam coils arranged horizontally or longitudinally in the room. Fans are used to circulate the heat among the goods and accelerate the rapidity of the drying process. The most recent development of the drying art is the automatic dry room. In this the goods are hung on hooks attached to an endless chain or wire cable, which enters into and occupies the room in a series of loops, and passes out at the other end of the room. The goods are dried in one time of passage, and are removed from the hooks by an automatic device so that they fall dry, into baskets on the outside of the room.


Reverse Washer.

Ironing Machinery.— The third general division of laundry work is the ironing, for which many forms and styles of machines are used. For collars and cuffs, it is done on machines consisting of a combination of revolving covered drums coming in contact with revolving heated rolls, the goods being ironed as they pass through. The covered drum is wound with layers of felt, cotton flannel and muslin, forming a padding much the nature of that which covered the old-fashioned family ironing board. The heated rolls are highly polished and are heated by gas or steam. Formerly all these machines required the goods to be passed through several times for a perfect finish. The more modern types of ironers are known as «one pass machines.» These have a series of heated rolls and drums so that the collar is put in at the front of the machine and comes out at the back perfectly ironed. Some of these ironing machines of modern production have a capacity of from 250 to 300 dozen collars or cuffs per hour. The length of the ironing surface of the heated rolls of collar and cuff ironing machines of different sizes varies from 12 to 48 inches. For the ironing of flat pieces such as sheets, table linen and towels, a machine known as the mangle is used, by which the goods are dried on revolving cylinders heated by steam. In the recent types of mangles great capacity is attained; in some the length of ironing surface reaches ten feet and requires several operators to feed the machine. For shirts, a separate class of ironers is required. These are the bosom, body, sleeve and band ironers. The general principle and operation are, however, the same as in the collar and cuff ironers, previously described. The most recent development of shirt ironing machinery is a series of machines steam heated, and on which the finish is produced by pressing instead of ironing.



Collar and Cuff Ironer.

Other important machines not described above and which are used in laundering are starchers, shapers and dampeners. There are many other forms of laundry machinery made to cover parts of processes, and new forms and types are constantly being invented and put on the market. John T. Birge,
Vice-President and Treasurer, Adams Laundry Machinery Company.

Launitz, Robert Eberhard, Russian-American sculptor: b. Riga, Russia, 1806; d. New York 1870. He studied under Thorwaldsen in Rome; emigrated to America in 1828, and in 1833 became a member of the National Academy. Among his works are the Pulaski monument at Savannah, Ga., and the battle monument at Frankfort, Ky.

Laupen, low-pĕn, town in Canton of Bern, Switzerland, situated at the junction of the Sense and Saane, 10 miles southwest of Bern. It was the scene of a victory of Bern over Fribourg and allies in 1339.

Laura, the French lady celebrated by Petrarch as the object of his life-long passion: b. Eaumont, Provence, 1308; d. Avignon 6 April 1348. Petrarch has told us that he saw her for the first time in the Church of Santa Chiara at Avignon, on Good Friday 6 April 1327; that she was the mother of several children and died on Good Friday at the hour in which he had first seen her, and was the same evening laid to rest in the Franciscan Church. It would appear that Laura was the daughter of Audibert de Noyes and was married to Hugo de Sade and bore him 11 children. There is no ground for supposing that Laura was a mere creature of the poet's fancy. But consult: Minich, 'Sulla Persona della Celebre Laura,' in 'Atti dell Instituto Veneto' (Vol. IV., series 5, 1877–8); D'Ovidio, 'Madonna Laura' (in the 'Nuova Antologia' 15 July, and 1 Aug. 1888).

Laura, a small monastic community, such as was common in Egypt, Palestine and Syria. It formed a mean between the solitude of the hermitage, and the community life of the mediæval monastery. There was a superior, but no very definite rules. The cells were separately clustered like an encampment round the chapel. The brethren only met together twice a week, and subsisted on bread and water. Three monks occupied one cell, under Pachomius. A famous laura was founded by Chariton, a hermit, at Pharan near Jerusalem, and others in the 5th century by Sabas, a celebrated hermit. The Empress Eudocia, wife of Theodosius II. also instituted a laura. The derivation of the term laura is uncertain.

Laura'ceæ. See Laurel.

Lauraguais, lō-rā-gü-ā', an ancient division of Languedoc, France, situated near Castelnandary. It now forms parts of the departments of Aude, Tarne, and Haute-Garonne.

Lau'reate, Poet. See Poet Laureate.

Laurel, lâ'rĕl, Miss., town in Jones County, on the Gulf & S. I., and the New Orleans & N. W. R.R.'s. In 1890 this was a village of 100 people, while in 1903 it had 7,000 population. The town owes its beginning to the sawmills of Eastman, Gardiner & Company, and of the Kingston Lumber Company. These sawmills have timber sufficient to last them at least 25 years. Laurel has the following important industries in addition to its sawmills: Laurel Cotton Mill, having 10,000 spindles and 640 looms, and employing 400 hands; Laurel Oil & Fertilizer Company — using 40 tons of cotton-seed daily; Lindsey Wagon Company; Brick & Tile Company, having a capacity of 30,000 bricks per day, and Mississippi Knitting Mills, with a capacity of 125 pairs of hose per day. It also has many smaller factories, as a machine shop, foundry, cotton compress, ice factory and electric light and power plant. The town has two national banks.

Laurel, a tree or shrub of the order *Lauraceæ,* having alternate, simple, often evergreen, exstipulate leaves; panicles or umbels of perfect flowers and one-seeded drupes or berries. The species, of which there are about 1,000, mostly tropical, are divided into about 40 genera and are most largely represented in Brazil and southwestern Asia. Among the best-known American members are the red bay (*Persea carolinensis*), sassafras (*Sassafras officinale*), pond spice (*Litsea geniculata*) and wild allspice (*Lindera benzoin*), all of which are found east of the Mississippi. The tropical species are, however, more important. Among them are avocado or alligator pear (*Persea gratissima*), cinnamon, camphor-tree and cassia (*Cinnamomum*), and greenheart (*Nectandra rodiæ*). The name is usually restricted, however, to trees of the type-genus *Laurus*, the few species of which are natives of southwestern Asia, but have become naturalized in the Mediterranean region, and are characterized by dark, evergreen leaves, small, diœcious or perfect, inconspicuous flowers in little axillary umbels, and small, succulent, purple, cherry-like berries. They sometimes attain heights exceeding 50 feet, but are usually scarcely more than a third of this height. The most popular species is the poet's or wreath laurel (*L. nobilis*), called in America sweet-bay. See BAY.

Among the numerous other shrubs known as laurels are the mountain-laurel (q.v.) and other species of *Kalmia*, the Portugal laurel (*Prunus lusitanica*), the cherry-laurel (*Prunus laurocerasus* and *P. caroliniana*), and the ground-laurel (*Epigæa repens*), better known as «trailing arbutus.»

Laurel-magnolia, the sweet-bay. See BAY.

Laurence, lâ'rĕns, **Saint,** Roman Christian martyr: d. Rome 10 Aug. 258. He was of Spanish race, and when, in the Valerian persecution Pope Sixtus II. was carried to martyrdom, Laurence as deacon and treasurer of the Church refused to give up the keys of the treasury, and according to tradition was put to death by being laid over a fire on bars of iron. The Escurial was built by Philip II. in fulfilment of a vow made on St. Laurence's day, 10 August, to the honor of that saint, the ground plan being after the pattern of a gridiron.

Laurence, Samuel, English painter: b. Guilford, Surrey, 1812; d. London 28 Feb. 1884. He was one of the most successful portrait painters of his day, and had as sitters many of his most eminent contemporaries; including Whewell, Browning, Carlyle, Dickens, Froude, F. D. Maurice, Thackeray, Tennyson and Lowell.

Laurens, lâ'rĕns, **Henry,** American patriot and statesman: b. Charleston, S. C., 1724; d. there 8 Dec. 1792. He was a mercantile clerk in London and Charleston, and in the latter place established a successful business. An opponent of royal aggression, he was involved in numerous disputes with the crown judges regarding their decisions in marine law and the admiralty courts. Having withdrawn from active business, in 1771 he went to England, and was there one of the 38 Americans who in 1774 signed a petition to advise Parliament against passing the Boston port-bill. In 1775 he became a member of the first South Carolina provincial congress, in 1776 vice-president of the council of safety in that colony, and from 1 Nov. 1777, to 10 Dec. 1778, was president of the Continental Congress in succession to Hancock. He sailed in 1779 as minister to Holland for the negotiation of a treaty with that country, but his packet, the Mercury, was captured by the British, he was examined by the privy council, and from 6 Oct. 1780 was imprisoned for about 15 months in the Tower on suspicion of high-treason. Having been exchanged for Cornwallis, he was sent to Paris, where with Adams, Franklin, and Jay, he signed the preliminary treaty of peace with Great Britain 30 Nov. 1782. His ‘Correspondence,’ edited by Moore, was published in 1861.

Laurens, Jean Paul, zhŏṅ pōl lō-rŏṅ, French artist: b. Fourquevaux, department of Haute-Garonne, in 1838. He studied in the Ecole des Beaux-Arts at Toulouse, and became a pupil of Cogniet and Bida in Paris. His work is distinguished for boldness and vigor, and the tragic elements of his subjects are heightened by the dramatic realism of the artist. In point of moderation in treatment, and of taste in coloring, his compositions have received some adverse criticism, but his powerful effects are not called in question. In 1891 he was elected a member of the Académie des Beaux-Arts and president of the Société des Artistes Français. Among his pieces are: ‘Death of Tiberius’ (1864); ‘A Voice in the Desert’ (1868); ‘Execution of the Duc d'Enghien’ (1872); ‘The Pool of Bethesda’ (1873); ‘The Interdict’ (1875); ‘The Austrian General Staff around the Deathbed of General Marceau’ (1877); and ‘Napoleon and Pius VII. at Fontainebleau’ (1894).

Laurens, John, American soldier: b. South Carolina 1753; d. there 27 Aug. 1782. He was the son of Henry Laurens (q.v.). He was educated in England, and in 1777 became an aide to Washington, whose secretary he also frequently was. From the battle of Brandywine (11 Sept. 1777), he participated, it is said, in all actions in which Washington commanded. He was severely wounded at Germantown, commanded the light infantry when the united American and French troops under Lincoln and D'Estaing attempted the capture of Savannah, and aided in the defense of Charleston when besieged by Clinton. In the spring of 1781 he was sent to France to obtain money and supplies. Contrary to diplomatic precedent, he requested and obtained an audience with the king, and secured the necessary assistance. He captured one of the two redoubts at Yorktown, and received Cornwallis' sword. He was killed in a skirmish on the Combahee River, S. C. What Washington called his «intrepidity bordering on rashness» won for him the sobriquet of «the Bayard of the Revolution.» His correspondence, with a memoir by William Gilmore Simms, was privately printed in 1867.

Laurens, Joseph Augustin Jules, zhō-zĕf ō-güs-tăṅ zhül· lō-rŏṅ, French painter: b. Carpentras 1825. After studying painting under Delaroche, he traveled in Persia, Turkey, and Asia Minor. As a landscape painter he obtained wide recognition and was also highly successful in his lithographic copies of Diaz, Bonheur, Corot, Tryon, etc. His pictures in color include: ‘Vue de la Grande Chartreuse’ (1840); ‘Les Environs de Vaucluse’ (1845); ‘Forêt de Fontainebleau’; ‘L'Hiver en Perse’ (1867); and ‘Le Rocher de Vannes’ (1897); which last is in the Luxembourg. He has published with original illustrations ‘Voyage en Turquie et en Perse’ (1856).

Laurent, Auguste, ō-güst lō-rŏṅ, French chemist: b. La Folie, Haute-Saône, 14 Nov. 1807; d. Paris 15 April 1863. In 1838 he became professor to the Academy of Sciences of Bordeaux, which post he held for eight years. In 1848 he was made assayer to the mint and chemical adviser of the minister of war. His researches were very numerous, embracing all departments of the science, organic and inorganic, and opening up new fields and new views. He was one of the champions of the unitary system against the dualistic held by most of the chemists of the time. He was opposed also to the electro-chemical theory, which his investigations into the derivatives of naphthaline did so much to shake, and maintained the doctrine of types — forms of constitution of bodies which admitted of parts being substituted by other elemental or compound substances without the type of the original body being altered. His views on general chemical theory appeared in a posthumous work entitled 'Méthode de Chimie,' translated into English by Odling, and published by the Cavendish Society 1855.

Laurentian (lâ-rĕn'shĭ-ăn) **Mountains,** a range in British North America, extending for over 3,000 miles from Labrador to the Arctic Ocean, forming the watershed between Hudson Bay, the Saint Lawrence, and the Great Lakes, and dividing the same bay from the sources of the Mackenzie River. The average elevation of this range is about 1,500 feet, while some of the peaks attain a height of 4,000 feet. The rock formation belongs to the sedimentary deposits known as the Laurentian system.

Laurentian System. The term Laurentian has been applied by certain Canadian geologists to a great series of rocks, partly of sedimentary and partly of igneous origin, that is typically developed on the Laurentian Hills north of the St. Lawrence River. Similar rocks occur elsewhere along the Height of Land, from Labrador to the western end of Lake Superior. The rocks are of very ancient date, but the exact significance of the term Laurentian as a time division or as a lithologic name is in dispute. The typical Laurentian includes a series of gneisses, mica schists, quartzites and crystalline limestones with intrusive granites and green stones. The total thickness may be 30,000 feet. The term Laurentian is little used by American geologists, and about all that can be said of the age of the Laurentian rocks as a whole is that they are certainly pre-Cambrian.

Lauric Acid, or **Dodecoic Acid,** a fatty acid occurring (as glyceryl ether) in the berries of the bay-tree (*Laurus nobilis*), in pichurim beans, in cocoanut oil, and elsewhere. It may be prepared from the oils in which it occurs by saponification, followed by the fractional precipitation of the acids by means of barium acetate. Lauric acid has the formula $C_{12}H_{24}O_2$, and is insoluble in water, but very soluble in both alcohol and ether. From its solution in alcohol it crystallizes in the form of silky needles, melting at 110° F. With the metals it forms a series of salts called laurates, which, with the exception of barium laurate and the laurates of the alkali metals, are mostly insoluble in water. The glyceryl ether (also known as trilaurin, or laurostearin), has the formula $C_3H_5(C_{12}H_{23}O_2)_3$, melts at 113° F., and may be obtained from bay-berries by extraction with alcohol.

Laurie, low'rĭ, **Simon Somerville,** Scottish educator: b. Edinburgh 13 Nov. 1829. He was educated at the University of Edinburgh; for five years was a teacher on the Continent; and returning to Scotland held important positions in connection with education. In 1876 he was appointed to the professorship of the institutes and history of education in the University of Edinburgh. He has published many works, among which are: 'Philosophy of Ethics' (1866); 'Language and Linguistic Method in the School' (1890, 3d ed. 1899); and 'Historical Survey of Pre-Christian Education' (1895, 2d ed. 1900).

Laurier, lō'rĭ-ā, Sir **Wilfrid,** Canadian political leader: b. St. Lin, L'Assomption County, Quebec, 20 Nov. 1841. He studied at L'Assomption College and law at McGill University (Montreal); in 1865 and 1866 was a vice-president of the Institut Canadien (Montreal), which formed the nucleus of a movement toward intellectual liberalism on the part of the younger French and was strongly opposed by the clergy; and in 1866 opened a law office at Arthabaskaville. In 1871 he was elected to the Quebec legislature, where his first speech was considered as a national event by his countrymen, and in 1874 was chosen at the general election to the Ottawa House of Commons for the Drummond and Arthabaska district. He was soon recognized as one of the most eloquent speakers of the Canadian Parliament and became the first. His speeches on certain questions were considered by many as the best which had ever been delivered in the House. At the outset he was regarded as the leader of the Liberals in Quebec province, and in 1877 was selected for the portfolio of inland revenue in the Mackenzie administration. In 1878 he retired upon the return to power of Sir John Macdonald and the Conservatives. On 7 June 1887, he succeeded Blake as chief of the Liberal opposition, though he himself advised the choice of an English-speaking Protestant; and in 1896 he became the first French-Canadian premier of the Dominion. In that post he has observed a policy of discrimination in favor of British products and of protection against the United States for at least so long as Canadian products are denied American markets. He has rendered great service through his strong opposition to antagonisms of creed and race. Of all the representatives of the colonies in England on the occasions of the Queen's Jubilee and of the coronation of Edward VII., he was the most remarked by the refinement of his manners and of his eloquence, and was recognized in Paris as in London as one of the most eloquent speakers of our time either in French or in English. While a great admirer of England's political institutions, he is an ardent Canadian and a thorough believer in Canada's destiny. He opposed the imperialistic policy of Chamberlain and contributed more than any other man to prevent him from drawing the colonies into the "vortex of warlike imperialism," to use his expression. He has had to pass through all kinds of political and religious difficulties, and has given evidence of qualities and talent which would have made him distinguished as a speaker and a statesman in any country of the world.

Consult his 'Speeches,' edited by Barthe (1890); Willison, 'Sir Wilfrid Laurier and the Liberal Party' (1903); and Daniel, 'Laurier and His Time.'

Laurium, lâ'rĭ-ŭm, Mich., village in Houghton County; on the Copper R. and Mineral R. R.R.'s. It adjoins Calumet, and is 7 miles from Lake Superior and 12 miles north by east from Houghton. It is situated in the Keweenaw Peninsula, in the northern part of the State, in one of the richest copper regions of the United States. There is considerable local trade. Copper mining is the chief occupation. Pop. (1903) 9,000.

SIR WILFRID LAURIER.

Laut, Agnes C., Canadian author: b. Ontario 11 Feb. 1872. In childhood she was taken to Winnipeg. She entered Manitoba University and studied there into the junior year, during which she withdrew on account of ill health, afterward spending her summers in the Rocky and Selkirk mountains. In 1895–7 she was an editorial writer for the Manitoba *Free Press,* Winnipeg; subsequently became correspondent of Canadian and English papers and of newspapers and magazines in the United States. She has written 'Lords of the North' (1900); 'Heralds of Empire' (1902); and 'The Story of the Trapper' (1902).

Lauzon, Jean de, zhŏṅ dė lō-zŏṅ, French colonial administrator: b. 1582; d. 1666. He was a member of the Hundred Associates, who organized to promote the settlement of New France. He seems to have directed most of his energies toward acquiring landed property in Canada for himself and his family, and gained for his son the sole right of fishing on 60 leagues of the St. Lawrence, with a title to the adjacent lands. His own title to the island of Montreal he sold to the Jesuits. He was for five years governor of New France (1651–5), but his policy was feeble and short-sighted. He returned to France before his second term was over.

Laval-Montmorency, François Xavier de, fraṅ-swä ksăv-ē-ā dė lä-väl-môṅ-mō-rŏṅ-sē, French Roman Catholic prelate: b. Laval, France, 30 April 1623; d. Quebec 6 May 1708. He became a priest in 1645, and in 1651 was appointed missionary bishop of Cochin-China, a post which he declined to become archdeacon of Evreux. In 1659 he came to Canada as apostolic vicar, with the dignity of bishop of Petra *in partibus.* There he established (1663) the Quebec Seminary. In 1674–83 he was titular bishop of Quebec. He was an active and influential figure in governmental affairs. Laval University at Quebec is named in his honor.

Laval University, Montreal, Canada, was founded at Quebec, in 1852, by the seminary of that city, which gave it the name of its own founder, Mgr. François de Montmorency-Laval, first bishop of Quebec. The directors of this institution obtained then from Her Majesty Queen Victoria a charter which in confirming the rights and privileges they had enjoyed up to that time also conferred upon them university rights and privileges, for the instruction of youth in secondary and professional studies.

In 1876, following a request from Mgr. Bourget, bishop of Montreal, to secure a Catholic university in his episcopal city, the Sacred Congregation of the Propaganda enjoined Laval University to establish a branch at Montreal, to give therein the same instruction as at Quebec. This curriculum was inaugurated in 1878, in the faculties of Theology and Law, in 1879 in the faculty of Medicine, and in 1887 in the faculty of Arts. By virtue of the apostolic constitution Jamdudum, of 2 Feb. 1889, the branch is to-day practically independent of the establishment at Quebec. It receives its degrees from that University Council, but enjoys its own government and a complete local administration. It comprises four faculties, those of theology, law, medicine and of arts (sciences and letters), three aggregated schools, the Polytechnic, the School of Comparative Medicine and Veterinary Science of Montreal, and that of Dental Surgery. The French language is used in all sections except that of Theology, where Latin prevails. The professors of the faculty of Theology are appointed by the Grand Seminary of Montreal, directed by the priests of Saint Sulpice. The ordinary course is three years and three months. Some pupils prolong their stay six months to prepare themselves for doctorship. A greater number, after completing their course at Montreal, go to take their degrees in Rome, where the Seminary of Saint Sulpice of Montreal, has opened a college for Canadian students.

The faculties of Law and Medicine are installed in an edifice on Saint Denis Street, where they have large class rooms, sectional libraries, play rooms, a gymnasium, etc. The faculty of medicine has a lecture room, a dissecting room and four laboratories, for chemistry, histology, bacteriology, and medical electricity. The present faculty of Medicine continues the School of Medicine and Surgery of Montreal, founded in 1845 and affiliated to the Victoria University, of Coburg (Ontario), from which it received its degrees until the year 1890. At this period the school had its charter modified by the Quebec government and allied itself to the Montreal section of the faculty of Medicine of Laval University, with which to-day it forms one body. It receives its degrees from Laval University, but has maintained its charter and autonomy.

As the scientific and literary course which is usually followed by this faculty in the English universities is given, in this province, to Catholic youths by the colleges and seminary schools affiliated to Laval University, where the pupils obtain the degrees of bachelor of letters, of sciences or arts, a complete instruction of this kind is not imposed on the University. Two courses relevant to this faculty, are actually given there, that of French Literature, founded in 1898, by the late Abbe Colin, superior of the seminary of Saint Sulpice of Montreal. Up to that time this course had been given by a Fellow of the Paris University. The second course has for its object Ecclesiastical Public Law, and comprises 20 lessons. The other professors, ecclesiastic or lay, of the Faculty of Arts give a regular course in the colleges affiliated to the University, or are occasionally called to give public conferences at the University.

The Polytechnic School of Montreal, founded in 1874 and aggregated to Laval University in 1887, is largely supported by the government of the Province of Quebec. It corresponds by the nature of its curriculum, to the faculty of applied science in other universities. It prepares for the different branches of civil and industrial engineering, such as public works, railways, engines, mines, bridges, and steel construction, etc.

The School of Comparative Medicine and Veterinary Science of Montreal exists since 1886. Aggregated to the University, it is under the control and submissive to the inspection of the Minister of Agriculture of the Government of Quebec, from which it receives a grant. Its system requires a three years' course and the final degree is that of doctor of veterinary medicine. The school has a very interesting pathological museum at the University. The number of pupils, nearly all from this province, is not great, but it tends to increase as the farmers are beginning to recognize the value of the services which can be rendered them by veterinary doctors, who are well up in their profession. The School of Dental Surgery of Montreal is the continuation of the French section of the College of Dentistry of the Province of Quebec founded in 1894. It was affiliated to Laval University in February 1904, and obtained legal existence by an act of the Legislature of Quebec, in the month of May of the same year. This school, intended for the French Canadian youth of this country and the need for which arose from the rapid progress Dental Surgery has made within the past few years, is now launched, left to its own resources and depending solely on the devotedness of its professors. The course covers a period of four years and the final degree is that of Doctor of Dental Surgery. The Infirmary is open every day from 1 October to 1 April, from 9 A.M. until noon, and the poor receive, under the direction of competent professors, gratuitous attention or at a slight outlay to cover the cost of material. An ecclesiastical vice-rector, chosen by the bishops of the province of Montreal is appointed by the University Council of Quebec. He represents, for discipline and general administration the University, the Corporation of Administrators and the Bureau of Governors; an executive committee of five members, delegated by the bureau, assists him in the management of current affairs and in the execution of the decisions of the Corporation and Bureau.

The Archbishop of Montreal, by rank of vice-chancellor, controls the nomination and dismissal of the professors, and exercises a strict surveillance over doctrine and discipline. He is by right the president of the Corporation of Administrators, which owns the University and manages its finances. The suffragan bishops of the ecclesiastical province of Montreal, the delegates of all the affiliated colleges and seminaries, of the same province, the delegates of faculties and former graduates also sit in this corporation, which generally operates through a bureau of governors, composed of eminent personages in finance and the liberal professions.

G. BOURASSA,
Secretary of the University.

Laval University, Quebec, Canada. The first establishment of higher education in Lower Canada was founded in 1852. The directors of the Seminary of Quebec, the pioneer institute in the educational field, secured from her majesty, Queen Victoria, a charter which conferred on the seminary the privileges of a university. A petition signed by the archbishop and bishops of the ecclesiastical province of Upper and Lower Canada was presented at Rome, requesting that the Seminary of Quebec be accorded the customary rights of a Catholic university, and in particular that of conferring diplomas in Theology and Canon Law. Pius X. did not at once grant what was asked. At that time Great Britain refused to recognize the ecclesiastical titles given by the Holy See; she also denied legal existence to the Catholic University of Dublin, and they feared in Rome that the foundation of a Catholic university in Quebec would prove an impossibility. For this reason they wished to be assured of the grant of a royal charter before they extended canonical privileges. As soon as the official document was received from London, which was towards the end of December 1852, an authentic copy was forwarded to Rome and on 6 March 1853 the Holy Father sent a brief which granted to the Archbishop of Quebec the right to confer theological degrees upon those who completed their ecclesiastical studies at the Quebec University.

In the Royal Charter, the Roman Catholic Archbishop of Quebec, by virtue of his office, is named the visitor of the university, which shows the broad-mindedness of the English government which permitted the French-Canadian Catholics to organize their university teaching without any control save that of an archbishop of their own nationality and faith. The state renounced all interference in questions of programme or inspection. The visitor received the most extensive powers, he was given the right to veto on all regulations and nominations, and on presentation of the council, he could appoint the professors of the Faculty of Theology. As to the office of rector, the highest in the university, it devolves, by right, by the terms of the charter upon the superior of the Seminary of Quebec. This office is, therefore, essentially temporary, since the superior of the seminary, elected for three years and re-eligible after the first triennial, cannot occupy the post entrusted to him longer than six consecutive years, unless a special authorization be accorded by ecclesiastical authority.

The charter also provides for the establishment of a council which conjointly with the rector administers the affairs of the university. This council is composed of all the directors of the seminary and of the three oldest titulary professors of each faculty. It has the power to make the statutes and regulations which it may judge suitable, with one condition, that these statutes and regulations contain nothing contrary to the laws of the United Kingdom or of Canada.

This council held its first session on 21 Feb. 1853, when it resolved that Laval University should include four faculties: those of Theology, Law, Medicine, and Arts. Each faculty is provided with a special council which discusses and submits to the university council all questions which may directly interest one or the other of these faculties.

The Faculty of Theology was not immediately created at Quebec. The number of aspirants to the priesthood was limited and the needs of the parochial ministry so urgent and so multitudinous that the seminarians could not be allowed the time to devote themselves freely to the study of the higher ecclesiastical sciences. It was only in the year 1866 that the basis of a Faculty of Theology was laid. The Faculty of Medicine, on the contrary, was organized and put in motion in the year 1853. A School of Medicine already existed in Quebec. The directors of the university found therein a certain number of professors who were prepared to give medical instruction. The School of Medicine was willing to efface itself and make way for the budding faculty of Laval, and six of its professors resigned and accepted professorships at the university. The course in Medicine was fixed at four years. As there were two large hospitals in Quebec, those of the Hotel-Dieu and the Navy, the students of the faculty were enabled to follow numerous and various clinics.

It was not such an easy task to organize a Faculty of Law, and in the year 1854 the first steps towards this end were taken. However, of all the branches of the University, teaching of law was the one for which the greatest need existed, as there was no school of law in Quebec. There were many distinguished lawyers who could have filled professorships but, they lacked the enthusiasm to devote themselves to teaching and were not willing to sacrifice, however little, without sufficient compensation, a numerous clientele. There was great difficulty in realizing the plan first conceived. After various proceedings, two professors were found, one being a judge of the Superior Court, who was named dean. In 1855 the university council was able to add four other representatives to the Faculty of Law. Unfortunately the greatest number of these professors were prevented by reason of their external occupations, from preparing and giving their courses so much so that during several years the teaching of the Faculty of Laws was limited to the courses of Civil and Roman Law. In 1857, it was necessary to call a professor from France to give lectures on Roman law.

The Faculty of Arts was to be the least favored of all the faculties. The students who had received at the colleges and seminaries the basis of a literary or scientific education were not inclined to further pursue these studies. Being obliged to earn a livelihood by entering one or the other of the liberal professions they commenced their studies in Theology, Law or Medicine immediately upon terminating their classical course. They had neither time nor money to devote to the study of the higher branches of letters and sciences. For this reason Laval University did not deem it opportune to establish, in the first years of its existence, professorships of advanced instruction in the Faculty of Arts. In 1855 a Faculty of Arts was outlined.

Laval University had by virtue of its charter the power to confer diplomas of bachelor, licentiate, or master, and of doctor in the Faculties of Law, Medicine and Arts. It could not confer degrees in Theology. The papal brief accorded by Pius IX. granted this privilege to the Archbishop of Quebec. The university did not receive all the rights of a canonical university until the year 1876.

In 1870 the Faculty of Medicine of Laval had the favor and honor of being affiliated to the Royal College of Surgeons of London. This granted the university and the students of the Faculty of Medicine the following privileges: (1) The enrollment examination of Laval University is recognized as equivalent to the preliminary examination of the Royal College of Surgeons of London; (2) the certificates of assiduity gained by enrolled students of the medical course are recognized by the Royal College; (3) Doctors in Medicine of Laval University are admitted to the examination for diploma as member of the Royal College of Surgeons of London.

In 1865 the rector asked and obtained from Rome an indult which gave the Archbishop of Quebec the power to confer degrees in Theology upon all students of the grand seminaries of the Canadian province. In 1866 Laval University organized its Faculty of Theology.

The library of the Quebec Seminary included at the time of the foundation of the university over 15,000 volumes, 1,000 volumes for the Faculty of Law, and 2,000 volumes for the Faculty of Medicine, were then added. In 1876 this library contained about 55,000 volumes. At the present time it contains over 140,000. The seminary cabinet of physics is one of the most complete in America.

In 1897–8 a bacteriological laboratory was installed and in the following year a laboratory in experimental chemistry for analytical work was placed at the disposal of the students. The university has a number of splendid museums as follows: (1) Invertebrate Museum, comprised of several distinct collections. The entomological collection numbers over 14,000 specimens of insects from all parts of the world. The Conchyliological collection contains nearly 1,000 species of Canadian and foreign mollusks. (2) Museum of Ethnology, in three divisions: (a) the Indian collection; (b) the Chinese and Japanese collection; (c) the general collection. (3) Religious Museum, containing religious souvenirs, etc., and particularly the lead tomb with remains of the wooden coffin in which reposed for nearly two centuries the remains of Francis de Laval, first Catholic bishop of Canada and founder of Quebec Seminary. (4) Museum of Paintings, containing many old and valuable paintings by the old masters. (5) Mineralogical and Geological Museum, containing over 5,000 specimens. (6) Botanical Museum; (7) Zoological Museum; (8) Numismatic Museum containing over 3,000 coins and medals.

The Faculty of Theology numbers (1904) over 120 students. In 1902, 84 students enrolled and followed the course of the Faculty of Law and 97 students that of Medicine.

O. E. Mathieu, Ptre,
Rector of the University.

La Vallière, Louise Françoise de la Baume le Blanc de, loo-ēz frän-swäz dė lä bōm lė blän dė lä vä-lē-är, French mistress of Louis XIV.: b. Tours 7 Aug. 1644; d. Paris 6 June 1710. She was descended from an ancient and noble family, and in 1661 was brought to court by her mother, where Louis presently noticed her. Her manners were amiable and winning, and her sweet and tender disposition rendered her attractive. What is still more extraordinary, notwithstanding her equivocal position, she possessed extreme, indeed morbid, delicacy and modesty. She bore Louis four children, but was always painfully sensible of the disgrace of their birth. Two of them died in infancy. When superseded by Madame de Montespan she retired into the Carmelite convent in the suburb of St. Jacques, where she took the veil in 1675. She is considered the author of 'Réflexions sur la Miséricorde de Dieu' (1680), a copy of which dated 1688, with corrections by Bossuet, was discovered in the Louvre in 1852. A collection of her letters was published in 1767. Madame de Genlis wrote a historical romance founded on the events of her life, and Lebrun executed a penitent Magdalene, of which the face is from her portrait.

Lavater, Johann Kaspar, yō'hän käs'pär lä'vä-tĕr, Swiss physiognomist: b. Zürich 15 Nov. 1741; d. 2 Jan. 1801. As a youth he was not distinguished for studious methods, but early manifested a fervent piety and remarkable powers of persuasion in public discourse. He developed a distinct poetic gift, and was first known through his verses in 1767. Two years later he took orders, became pastor of a Zürich church in 1764, and served in that calling with different churches in his native city until his death. He also enjoyed a contemporary popularity through his mystical writings, now almost forgotten. He is best remembered as the originator of a system of physiognomy, which, although of little practical account to-day, is often referred to by students and writers. The book in which he set forth his system is entitled ‘Physiognomische Fragmente zur Beförderung der Menschenkenntniss und Menschenliebe’ (‘Physiognomical Fragments for the Promotion of a Knowledge of Man and of Love of Man,’ 1775–8). It was ornately published, with a profusion of striking illustrations, including portraits of distinguished persons, features to which its fame is considered to have been largely due. Yet Lavater's observations display a penetration and insight into human nature and its varying traits which entitle him to some consideration as scientist and philosopher, and there is a residue of his teachings which the inquiring world still appreciates. He enjoyed an intimate acquaintance with Goethe, who contributed to the ‘Fragments’ a chapter on the skulls of animals, and strikingly portrayed Lavater in ‘Wahrheit und Dichtung.’ Goethe afterward became estranged from him, accusing him, not without some grounds, of hypocrisy and superstition, but probably in fact repelled by Lavater's intellectual bigotry. Still Lavater was a man of large and open heart, personally and socially as hospitable as he was mentally intolerant, and with characteristics of true saintliness. During the French occupation of Switzerland he gave proof of his patriotism, and his death resulted from a wound inflicted by a French soldier at the capture of Zürich in 1799. There are several English translations of the ‘Fragments.’ Consult: Lives by Gessner (1802), Heisch (English, 1842), Muncker (1883); and monographs by Steck (1884) and Von der Hellen (1888). See PHYSIOGNOMY.

Lavedan, Henri, ŏṅ-rē lä-vĕ-däṅ, French journalist, critic, novelist, and playwright: b. Orleans 1860. He contributed under the pseudonym of «Manchecourt» a series of brilliant articles to ‘Vie Parisienne,’ ‘Gil Blas,’ etc., and in fiction has published: ‘Mam'zelle Virtue’ (1885); ‘Queen Janvier’ (1886); ‘Lydie’ (1887); ‘Inconsolable’ (1888); ‘High Life’ (1891); ‘A New Game’ (1892). Among his plays the most notable are: ‘A Family’ (1890), awarded a prize of 4,000 francs by the French Academy; and ‘Prince d'Aurec’ (acted in 1892).

Laveleye, Emile Louis Victor de, ā-mĕl loo-ē vĕk-tōr dė läv-lā, Belgian political economist: b. Bruges 5 April 1822; d. Doyon, near Liège, 3 Jan. 1892. He was educated at the Collège Stanislas, Paris, and at the University of Ghent, where he studied law, and in 1864 became professor of political economy in the University of Liège. Among his numerous writings are: ‘History of the Provençal Language and Literature’ (1846); ‘The Question of Gold’ (1860); ‘Property and its Primitive Forms’ (1874), his best known work; ‘The Religious Conflict in Europe’ (1875); ‘Contemporary Socialism’ (1881); ‘Elements of Political Economy’ (1882); ‘Money and International Bimetallism’ (1891); ‘Government in Democracies’ (1891).

Lav'ender, a genus (*Lavandula*) of perennial herbs, sub-shrubs and shrubs of the order *Labiatæ*, consisting of about 20 species, native to the Mediterranean region and southwestern Asia. The best known are true lavender (*L. vera*) and spike lavender (*L. spica*), which like other members of the genus have narrow leaves crowded near the ground, and blue or violet two-lipped flowers in whorls which form more or less interrupted spikes. All the lavenders contain similar volatile oils (oil of lavender, oil of spike, etc.), for which the plants are cultivated, and which are obtained from the flowers by distillation with water. The principal use of these oils is in perfumery, but they have been used in medicine as stimulants, tonics and stomachics. The dried flowers are placed with clothing laid away in bureaus and chests, partly because their aroma repels moths, but chiefly for the sake of the pleasant odor imparted to the garments. The perfume called lavender water is a solution of oil of lavender in spirit, along with attar of roses, bergamot, musk, cloves, rosemary, and other ingredients, which after standing for some time is strained and mixed with a certain proportion of distilled water. Lavender plants do not thrive as well in America as in English gardens, but succeed best in light, dry, friable soil, well exposed to the sun. They are best propagated by means of cuttings of one year's growth; seeds are unreliable, since they are slow to germinate and usually produce plants of inferior quality.

Laveran, Charles Louis Alphonse, shärl loo-ē äl-fôṅs lä-vĕ-räṅ, French physician: b. Paris 1845. He was graduated at the School of Military Medicine of Strasburg in 1867. In 1873 he was made a member of the faculty of Val de Grace, and after traveling in Algeria, was appointed professor of military hygiene and clinical medicine in that institution. In 1894 he was appointed director of the Eleventh corps in the Army Medical Service, and subsequently physician-in-chief of the Lille Hospital, and member of the French Academy of Medicine. He is the greatest living authority on malaria, of which disease he discovered the plasmodium. His most important published works are: ‘Traité des Fièvres palustres’ (1884); and ‘Traité de Hygiène militaire’ (1896).

Laverdière, lä-vär-dē-är', **Claude Honoré,** Canadian author and teacher: b. Province of Quebec 1826; d. 1873. He was educated for the priesthood, which he entered 1851, and was appointed professor in Quebec Seminary and assistant librarian in Laval University. His claim to recognition rests on the efforts he made to unearth and publish to the world the heroic achievements of early French-Canadian settlers and explorers. His works are of extreme value and interest, and include: ‘Jesuit Relations’ (1858); ‘History of Canada.’ He also edited ‘Voyages of Champlain,’ with notes and a life of that explorer. A collection of French-Canadian songs and hymns was also made and published by him.

Lavigerie, Charles Martial Allemand, shärl mär-sē-äl äl-mäṅ lä-vēzh-rē, French missionary: b. Bayonne 31 Oct. 1825; d. Algiers 26 Nov. 1892. After passing through the Seminary of Saint Sulpice at Paris he was appointed professor of ecclesiastical history to the Sorbonne in 1853. In 1863 he was made bishop of Nancy, and four years later archbishop of Algiers. His life work began by the establishment of his Central-African mission. On being made ecclesiastical administrator at Tunis he began fighting the slave-hunting and slave-barter which desolated the dark continent. For this purpose he agitated in the chief capitals of Europe, and secured pledges from England and Germany to enforce rigidly the anti-slavery article of the Kongo Conference. In 1890 he urged in France the Church's acceptance of the Republic, in which counsel it was considered that he was not without the concurrence of Leo XIII. He was made cardinal in 1882. His published works include 'Œuvres choisis' (1884).

Lavisse, Ernest, ėr-nä lä-vēs, French historian: b. Nouvion-en-Thiérache, France, 17 Dec. 1842. In 1888 he was appointed to the chair of modern history in the Paris Faculty of Letters and in 1892 was elected to the French Academy. His historical researches have chiefly to do with Germany, and among important works by him are: 'The Mark of Brandenburg under the Ascanian Dynasty' (1875); 'Studies of the History of Prussia' (1879); 'Frederick the Great Before his Accession' (1893); 'The Three Emperors of Germany: William I., Frederick III., William II.' (1888).

Lavoisier, Antoine Laurent, äṅ-twän lō-rōṅ lä-vwä-zē-ä, French chemist: b. Paris 26 Aug. 1743; d. there 8 May 1794. He was the son of a wealthy tradesman; was educated at the Collège Mazarin; studied mathematics and astronomy under Lacaille, chemistry in the laboratory of Rouelle, and botany under Jussieu. In 1766 he received a prize offered by the Academy of Sciences (of which in 1768 he became an associate), for an essay on lighting the streets of Paris. Soon after this he traveled through France collecting material from which he constructed the first geological chart produced in that country, during the same period publishing a number of scientific treatises. In 1769 he was appointed farmer-general of the revenue. By means of his wealth and influence he secured special advantages for extending his investigations, which were also stimulated by the new discoveries of Priestley, Cavendish, and Black. In 1776 he was director of the government powder-works; sat on the commission of weights and measures in 1790; and in 1791 became commissary to the treasury. In May 1794 he was accused before the Convention as an ex-farmer-general, condemned by the Revolutionary tribunal, and guillotined. To Lavoisier modern chemistry looks as its chief founder; he organized its methods, reformed the old nomenclature, and virtually established for this science a new terminology. By his work mainly the old phlogistic chemistry was displaced, and he shares with Joseph Priestley (q.v.) the distinction due to the discovery and analysis of oxygen, to which he gave his name, Priestley having already called it "dephlogisticated air." "Lavoisier," says Huxley, "first showed, by the most conclusive experiments, what was really the composition of atmospheric air" (1777). His chief works, as containing his most important discoveries, are his 'Traité élémentaire de Chimie' (1789); and 'Mémoires de Physique et de Chimie' (1805). Among his others are: 'Sur la Combustion en général' (1777); 'Réflexions sur le Phlogistique' (1777); 'Considérations sur la Nature des Acides' (1778); 'Méthode de Nomenclature chimique' (with Guyton de Morveau, Berthollet, and Fourcroy, 1787). His complete works were published by the French government under the title of 'Œuvres de Lavoisier publiquées par les Soins de son Excellence, le Ministre de l'Instruction publique' (1864–93). There are many accounts of his life and work. Consult: Grimaux, 'Lavoisier d'après sa correspondance, ses Manuscrits, ses Papiers de Famille et d'autres Documents inédits' (1888); and Schultze, 'Lavoisier, der Begründer der Chemie' (1894).

Law, John, of Lauriston, Scottish speculator: b. Edinburgh 21 April 1671; d. Venice 21 March 1729. For the purpose of remedying the deficiency of a circulating medium, he proposed to the Scottish Parliament the establishment of a bank with paper issues to the amount of the value of all the lands in the kingdom; but this scheme was rejected. In consequence of a duel he fled from his country and visited Venice and Genoa, from which cities he was banished as a designing adventurer. He accumulated a large fortune by gambling, and at length secured the patronage of the Duke of Orleans, regent of France, and in company with his brother William established his bank in 1716 by royal authority. It was at first composed of 1,200 shares of 3,000 livres each, which soon bore a premium. This bank became the office for all public receipts, and there was annexed to it a Mississippi company, which had grants of land in Louisiana, and was expected to realize immense sums by planting and commerce. In 1718 it was declared a royal bank, and shares rose to twenty times their original value. A vast quantity of paper money was issued, the credit of which was unquestioned, whilst the national bonds remained at a price far below their nominal value. In 1720 Law was made a councillor of state and comptroller-general of the finances; but the shares sank in value as rapidly as they had risen. He was obliged to resign his post, after five months, and for personal safety to quit the kingdom. He lived afterward in great obscurity, finally settling at Venice, and died still occupied in vast schemes, and fully convinced of the solidity of his system, the failure of which he attributed entirely to enmity and panic. Various opinions have been entertained of the merit of his project, and by some it has been thought to have possessed feasibility, had it been carried more moderately into practice. A volume entitled 'Œuvres de J. Law' was published (1790). Consult Wood, 'Memoirs of the Life of John Law' (1824); Mackay, 'Memoirs of Extraordinary Popular Delusions' (1850); Thiers, 'Histoire de Law' (1858).

Law, John, American lawyer: b. New London, Conn., 1796; d. Indiana 1873. He was graduated at Yale and admitted to the bar in 1817, but soon after emigrated to Indiana, where he settled at Vincennes. He was quickly brought to the front as a lawyer; became successively prosecuting attorney, judge for eight terms, and in 1838 receiver of public moneys. In 1855 he was appointed judge of the Court of Land Claims. He afterward served in the 37th and 38th Congresses on committees on library, agriculture, and Revolutionary pensions. He was descended from a long line of lawyers, which included the chief justice of the Connecticut supreme court, Jonathan Law, and was president of the Indiana State Historical Society.

Law, William Arthur, English playwright: b. 22 March 1844. He was educated at the Royal Military College, Sandhurst; served eight years in the army and retired as lieutenant. He acted at the Theatre Royal, Edinburgh, Surrey Theatre, and in the provinces, 1872–4, and in 1881 was engaged at the Savoy Theatre. Among his dramatic productions may be mentioned: 'A Night Surprise' (1877); 'Enchantment' (1878); 'Castle Botherem' (1880); 'All at Sea' (1881); 'Nobody's Fault' (1882); 'A Mint of Money' (1884); 'Gladys' (1886); 'Culprits' (1890); 'The New Boy' (1894); 'The Sea-Flower' (1898); 'New-Year's Morning' (1900); and 'A Country Mouse' (1902).

Law (Lat. *lex*, from *lego*, to collect), is in its general sense, a rule of action; in a more restricted signification, a rule of human conduct, or collectively a body of regulations adapted to a particular subject. The term may be variously defined, according to its application. The laws of nature, as expounded by men of science, are general propositions as to the order in which physical events have occurred, and will probably recur; the moral law, or the law of God, is a body of truth perpetuated into the form of rules for the guidance of human conduct. But when we speak of law we usually mean to indicate the law which is set and enforced by civilized states. Law, in this sense, derives its sanction, or binding force, from the penalties by which men are constrained to obey it or punished for breaking it. In the civil code of Louisiana, law is defined as a «solemn expression of the legislative will.» Law, regarded as a body of rules for the direction of the individual in his relations with society, is known under various subdivisions, as civil law, criminal law, common law, martial law, constitutional law, international law, merchant law, and canon law, in matters of ecclesiastical jurisdiction. The earliest source of law is custom; the customary rules of a primitive community formed the basis of a civil law at Rome, as they form the basis of the common law in England and the United States. Customary law is rigid and formal; in a progressive society it is relaxed and improved by the use of legal fictions, by the influence of equity, and by legislation. At Rome, for example, the growing commerce of the city compelled the prætor to go beyond the civil law (which was a law for Romans only), and to devise a new law of nations, based on principles of equity, such as all civilized men could understand. When the Romans began to study Greek they identified this law of nations with the law of nature, as expounded by the Stoics (q.v.). The civil law, amended and rationalized by successive prætors and emperors, has furnished most of the nations of modern Europe with the greater part of their legal rules and ideas; even England, while refusing to borrow directly from the *Corpus Juris Civilis* (body of the civil law), has derived no small part of her law from that source. Scotch law has largely drawn its principles and nomenclature from Roman law. It is usual to distinguish public law (constitutional and criminal) from private law (which applies to personal status, family relations, property and contract). Constitutional law is of especial importance in the United States. Canon law is not received, as an entire system, by any modern state; but its rules are followed in defining the powers and functions of ecclesiastical persons. The law of nations, or international law, is also divided into public and private.

Sacred Law.— Prior to the codex or early codes containing laws for the people, there were sacred books and doctrines which contained moral and spiritual rules and regulations for human conduct. The four famous law books of India were 'The Sacred Laws of the Aryas,' 'The Institutes of Vishnu,' 'Manu, the Moses of India,' and 'The Minor Law Books.' In China was 'The Book of Rites,' a work devoted to rules of ceremony and of behavior, together with the 'Four Books' of Confucius (q.v.), of equal canonical authority. There was also the Egyptian 'Book of the Dead,' and the Mohammedan 'Koran' (q.v.).

Laws of Moses.— The great Jewish historian and law-giver, Moses, of the tribe of Levi, is considered the author of the first five books of the Old Testament — Genesis, Exodus, Leviticus, Numbers, and Deuteronomy — or, as they are collectively called, the 'Pentateuch,' or the 'Five Books.' The Decalogue given through Moses, and many of the broader provisions of the Mosaic laws, form the basis of all present moral and legal codes. His institutions breathe a spirit of freedom, purity, intelligence, justice, and humanity, unknown to contemporary nations, and above all, of supreme love, honor and obedience to God. They molded the character of the Hebrews, and transformed them from a nation of shepherds into a people of fixed residence and agricultural habits. (See MOSES.)

Early Law-Makers.— Among the early books on law was Aristotle's lost work on 'Constitutions,' there being 158 of these, one 'The Constitution of Athens,' being left to us in its entirety. Among creators of early constitutions was Solon (q.v.), the illustrious legislator of Athens and one of the seven sages of Greece. He framed a new code of laws and obtained from the citizens an oath that they would observe them for 10 years. It was Solon who declared

> Ill fares the State where License reigns;
> But law brings order and concordant peace.

Among the law-givers of the period were Gellius, Cicero, Cæsar, Pliny, and Marcus Aurelius (q.v.), whose rules of civil law laid the foundation for Justinian's work. This was called 'The Pandects,' and was a digest of Roman law from the commentaries of the great jurists, made by 17 famous lawyers in 530–3 A.D.

Law in the Middle Ages.— In the 15th century Irnerius, a famous jurist at Bologna, revised the study of Roman law, and in the 16th century appeared the 'De Jure Belli et Pacis' of H. Grotius (q.v.), the distinguished Dutch scholar. This work and others have had no small influence on the laws of the present day. In the 17th century Samuel Puffendorf (q.v.), eminent German publicist, produced 'The Elements of Jurisprudence,' and 'The Law of Nature and Nations,' which to an extent superseded the works of Grotius. Early in the 18th century Emmerick Vattel (q.v.), the Swiss publicist, wrote his famous work, 'The Law of Nations, or Principles of Natural Law Applied to the Conduct and Affairs of Nations and Sovereigns.' It was translated into various languages, and partly superseded the productions of Grotius and Puffendorf. Then followed Coke and Blackstone (q.v.), the eminent English lawyers, with their invaluable 'Commentaries'; Kent, Maine, Bryce, and others who are famous as law-makers and interpreters of the early codes.

The Ancient Codes.— In the days of the early Roman emperors began to appear the *Codex* or code; collections of laws and constitutions, the earliest being those of Gregorianus or Gregorius and Hermogenianus. The 'Codex Theodosianus' was executed by a commission of eight persons, appointed by Theodosius the Younger, in 429. The work was published and promulgated as laws in 438, and was declared to be a substitute for all the constitutions made since the time of Constantine.

In 528 the emperor Justinian appointed a commission of 10 persons, one of whom was the celebrated Tribonian, to compile a code, incorporating the previous codes of Gregorianus, Hermogenianus, and Theodosius, and also the Constitutions, Rescripts, and Edicts, subsequently issued. The work was performed in 14 months, and it was then declared that the new code should supersede the older compilations. The code of Justinian is of great importance for church history and law, as many edicts of the Christian emperors concerned religious questions. The Gothic codes or laws of the barbarians were all collected in a single code which bore the title of *Codex Legum Barbarorum.* Of these various systems, the first was that of Alaric, king of the Visigoths, augmented by the legislative labors of his successors. To this code was given the title of the Gothic law, *par excellence,* and it was the best and fullest of all the barbarian codes.

Charles VII. was the first of the kings of France who attempted, by a series of general *ordonnances,* to introduce something like uniformity into the legislation of France; and several of his successors, in particular Louis XI. and Henry III., entertained the idea of establishing a single code for the whole kingdom. A code having this object in view was subsequently prepared by Michel de Marillac, and published in 1629. It consisted of 471 articles, and is spoken of by French jurisconsults in terms of the highest praise. In Spain in the 13th century Alphonso X., the most learned prince of his race, prepared the Spanish code called 'Las Partidas,' and executed the Alphonsine Tables.

The Code Napoleon (q.v.) was adopted in France in the 19th century. There were five codes, namely, the 'Code Civil,' published in 1804; the 'Code de Procédure Civile,' published in 1806; the 'Code de Commerce,' published in 1807; the 'Code d'Instruction Criminelle,' published in 1808; and the 'Code Pénal,' published in 1810; the first was called by way of eminence, by a law of 3 Sept. 1807, 'Code Napoléon.' At the restoration its name was changed back to 'Code Civil,' and during the time of the second empire it was again called 'Code Napoléon.' The first book is entitled 'Of Persons,' and in 11 titles treats, (1) of the enjoyment and privation of civil rights; (2) of civil acts, such as the registry of births, marriages, and deaths; (3) of domicile; (4) of absentees; (5) of marriages; (6) of divorce; (7) of the relations of father and son; (8) of adoption and official guardianship; (9) of the paternal power; (10) of minority, guardianship, and emancipation; (11) of majority, of guardianship of persons of age (interdiction) and judicial counsel. The second book is entitled 'Of Property and the Different Modifications of Ownership,' and in four titles treats (1) of the distinction of property into real and personal (*immeubles et meubles*); (2) of ownership; (3) of usufruct, of use and habitation; (4) of servitudes (easements, *des servitudes ou services fonciers*). The third book is entitled 'Of the Different Modes of Acquiring Property,' and in 20 titles treats, (1) of successions; (2) of donations *inter vivos* and testaments; (3) of contracts, or conventional obligations in general; (4) of engagements formed without a convention; (5) of the contract of marriage and the rights of the parties respectively; (6) of sale; (7) of exchange; (8) of the contract of letting to hire; (9) of partnership; (10) of loan; (11) of deposit and sequestration; (12) of contracts connected with chance (*aléatores*), such as wagers and life-rents; (13) of powers of attorney; (14) of becoming security; (15) of transactions; (16) of bodily duress in civil cases; (17) of furnishing security; (18) of mortgages; (19) of taking and setting off by execution; (20) of prescriptions. Under the first empire the adoption of the 'Code Napoléon' was made obligatory on all the countries subject to the French. After the battle of Leipsic, in 1813, which freed Germany from the power of France, it ceased to be obligatory in the German states, but it continued to influence considerably their legislation. At present this code is recognized in the kingdom of Belgium (with some modifications), in the grand-duchy of Baden, in the kingdom of Italy, and elsewhere in Europe. In the United States it was a model for the code of Louisiana. (See CODE.)

Legal Acts.— An act in law may be defined, (1) Anything officially done by a court, as the phrases "Acts of Court," "Acts of Sederunt," etc. (2) In bankruptcy, an act the commission of which by a debtor renders him liable to be adjudged a bankrupt. (3) In civil law, a writing which states in a legal form that a thing has been said, done, or agreed. (4) In evidence, the act of one conspirator performed in pursuance of the common design may be given in evidence against his conspirators. (5) Acts done, distinguished into acts of God (q.v.), of the law, and of men. (6) Legislative acts, enacted by a congress, legislature, parliament, etc. A statute, law, or edict, consisting of a bill which has been successfully carried through Congress, Parliament, or Legislature, and received the approval of the executive or chief ruler. (See ACT.)

Jurisprudence is the general title covering the entire field of law, the science and study of law, and the knowledge of the laws, customs and rights of men in a state or community, necessary for the due administration of justice. The various classifications of jurisprudence (q.v.) alphabetically arranged are as follows:

Admiralty Law in England and the United States is a system of jurisprudence administered by admiralty courts, which have jurisdiction over all marine torts, contracts, injuries, or offenses. Its civil jurisdiction extends to cases of salvage, bonds of bottomry or hypothecation of ship and cargo, seamen's wages, seizures under the laws of imposts, navigation, or trade, cases of prize or ransom, charter-parties, contracts of affreightment between different states or foreign ports, contracts for conveyance of passengers, contracts with material-men, jettisons, maritime contributions, and averages, and generally to all assaults and batteries, damages, and trespasses taking place on the high seas. Its criminal jurisdiction extends to all crimes and offenses committed on the high seas or beyond the jurisdiction of any country. (See ADMIRALTY LAW.)

By-Law is a law of a city, town, corporation or society. (See BY-LAW.)

Canon Law is the body of ecclesiastic Roman law. (See CANON LAW.)

Civil Law is the ancient Roman law, with the various modifications thereof which have been made in the different countries into which the law has been introduced. (See CIVIL LAW.)

Common Law is a rule of action which derives its authority from long usage or established custom, which has been immemorially received and recognized by judicial tribunals. As common law can be traced to no positive statutes, its rules or principles are to be found only in the records of courts and in the reports of judicial decisions. Common law is distinguished from the statute law and from equity. It is wholly overruled by the statute law. (See LAW, COMMON.)

Constitutional Law, a system of law established by the sovereign power of a state for its own guidance; the body of written public law. (See GOVERNMENT; LAW, CONSTITUTIONAL.)

Consuetudinary Law is that law which derives its binding character, not from the expressed, but from the tacit, consent of the general will of the community. As it is generally transmitted orally from age to age, it is often spoken of as the unwritten law.

Criminal Law is that branch of municipal law which relates to crime. (See LAW, CRIMINAL.)

French Law is the name given Norman dialect, or Old French, which was used in judicial proceedings from the days of William the Conqueror to Edward III.

Law of Merchants is the system of law which the courts of England and the United States apply to mercantile contracts. It is a branch of the common law, inferior in importance to no other, and in many respects quite distinct from any other. The principal subjects embraced within it are the law of shipping, including that of marine insurance; the law of negotiable bills of exchange and promissory notes; and the law of sales; all of which topics are treated of in this work specifically. The merchant law has grown up gradually, and, during the larger part of its existence, slowly. It originated undoubtedly in the customs of merchants. That it stands out in English law more prominently and distinctly than in any other general system of municipal law, may be reasonably ascribed to the greater extent of the commerce of England for many ages. It occupies a similar place in our law, in part because we inherit the law of England, and in part because the same extent of commerce which produced this system of law in England preserves it in the United States. In the earliest records of English law, we have distinct intimations that England in all periods of its history from the reigns of its Saxon monarchs, had many ships and many merchants; that questions in relation to the interests and contracts of merchants came not infrequently before the courts; and that these questions were decided even then by a reference to the customs of merchants, which was sometimes only understood, but in other cases was distinctly expressed. In doing this the courts only obeyed a necessity, which was felt wherever commerce existed and was respected. It is not to be concealed, however, that the courts did this with some reluctance, and by steps which followed each other only at long distances. The reasons for this are obvious, and may be discerned the more easily because they have not yet ceased wholly to operate.

The common law was, at a very early period, a quite complicated but well arranged and exceedingly systematic body of law. To know this was the privilege of a few — to administer it gave wealth and dignity to a very few. The law was then a monopoly, and one of very great value, and it was guarded carefully by those who possessed it. Merchants did not wantonly disregard it; but they were compelled to find, or to invent, for the various exigencies of their commerce, rules and principles different from those which had grown out of the feudal system, and were intended mainly to govern titles to land and the relations of feudal rank, and were admirably adapted for this purpose. When these mercantile contracts came before the courts, the same necessity which had led merchants to find and introduce their new rules, acted upon the courts, and induced the courts, more or less willingly, to accept these rules as their rules also, and thus to make them law. But while some of these rules were only modifications of the existing rules of the common law, others of them were very distinct exceptions, and some were positive contradictions. It was perhaps wise in the courts to regard with jealousy rules of law made by no sovereign authority, and neither evidenced nor promulgated in any authentic way. Nor are we obliged to attribute to mere selfishness of any kind the reluctance of the courts of law to admit these usages to the full force of law, at all periods and even at the present day. But at all times the established rules which governed the business and the contracts of any set of men, must have been recognized as law; and even the Roman civil law acknowledged the binding force of mercantile usage as constituting law. In 1765, Lord Mansfield (q.v.) declared «the law of merchants and the law of the land is the same,» and so the customs of merchants became the common law.

Law of Equity.— In England in the 18th century the law courts were divided into courts of law and courts of equity. In the law courts the parties were compelled to proceed strictly according to the law and the practice, and the forms of pleading were so intricate that many cases were decided on the pleadings without the merits of the case ever being heard; and often when the cause was heard it was impossible to administer justice on account of the form of action, the parties to the action, and the cause of action on which suit had been brought. In the courts of equity they were not restricted by the technical pleadings; amendments could more readily be granted; the parties to the action could be changed by either dropping some or adding others; and the decree could be framed to meet the particular question involved; so that justice would be done to all the parties interested. After the Revolution the United States adopted the English system; but while some of them have kept strictly to that system and have had distinct courts of law and equity, other States have law and equity administered by the same judges and courts, at one time sitting as courts of law and at another time as courts of equity. Equity is divided into three great classes or divisions: Equitable titles, equitable rights, and equitable remedies. Equitable titles are those which are recognized only by a court of equity, as where, when a person gave value for a chose in action which was assigned to him, the assignment was not recognized at law, as it would violate the rules against champerty and maintenance, but equity allows the assignee to bring suit in the name of the assignor. Equitable rights arise where a guardian enters into a transaction with his former ward a very short time after the ward has obtained his majority. If within a reasonable time the ward returns what he received from the guardian, the guardian will, in equity, be compelled to return the property to the ward. Equitable remedies arise in those cases in which the law recognizes a right but cannot enforce it, as where a contract is made for the sale of a piece of property, if the seller refuses to convey, the purchaser's remedy at law is for damages for breach of the contract; but in equity the court will decree specific performance. (See EQUITY.)

Law of Honor.—(See HONOR.)

Law of Nations.— According to Wheaton this «may be defined as consisting of those rules of conduct which reason deduces, as consonant to justice, from the nature of the society existing among independent nations, with such modifications and deviations as may be established by general consent.» International jurisprudence is a science of modern origin. In its present sense the law of nations was quite unknown to the two great states of Greece and Rome. In Greece the amphictyonic council bore in some sort the character of an international tribunal, but it concerned itself chiefly with the internal affairs of the members of the league; the few relations which Greece maintained with foreign nations were defined by special compacts, and the general principles of right were rarely invoked in their adjustment. The works of Cicero, Livy, and other writers of the best age of Rome, contain allusions which imply a recognized law of nations; yet it is certain that the Roman law, as it existed at the dismemberment of the Empire of the West, embodied no system of rules for governing the intercourse of states, or for deciding questions of right which might arise between them. During the Middle Ages, the pope was often the judge and arbitrator in the affairs of nations. His authority reached its height when Alexander VI. presumed to parcel out the New World to Spanish and Portuguese princes. It is now generally recognized that Hugo Grotius was the first to give a new form to the law of nations, or rather to create a science of which only rude sketches and undigested materials were scattered over the writings of those who had gone before him. Hallam says that the publication of the treatise by Grotius marks an epoch in the philosophical, and it may be said in the political history of Europe. It was very early translated into various European languages, and great jurists made it the subject of elaborate commentaries. In 1656 it was made the text of lectures on public law in the University of Wittenberg, and in 1661 a professorship was created in Heidelberg for expounding the law of nature and of nations from the writings of its author. The sources of international law are, according to Grotius, natural law, divine law, customs, and special compacts. In the celebrated reply made by the British government in 1753 to a Prussian state paper, the law of nations is said to be founded upon justice, equity, convenience, and the reason of the thing, confirmed by long usage. The principle of national justice, founded upon the laws of morality, is, then, the basis of the positive law of nations, that is to say, of the treaties, conventions, and usages which compose it. It is the office of right reason to apply this natural law of equity to the circumstances of each case; and it is the art of applying this law, according to justice and guided by reason, which renders international jurisprudence a particular science. Treaties and usages offer evidence of the general consent of nations, and are important sources of the law. The customary law of nations is further expressed in manifestos and declarations of war and in the decisions of prize courts. Finally, the concurrent testimony of the great writers upon the science, and the written opinions which official jurists give to their governments, are further evidence and depositories of the law of nations. (See INTERNATIONAL LAW.)

Law of Nature.—Laws and just rules of conduct which the Creator has prescribed to man, as a dependent and social being, and which are to be ascertained from the deductions of right reason. (See LAW, NATURAL.)

Law of the Land is the due process of law; the general, public, or common law of the land.

Maritime Law is the law of the sea; a branch of the commercial law, relating to the affairs of the sea, such as seamen, ships, navigation, etc. (See LAW, MARITIME.)

Martial Law is the law of military rule or occupation. (See MARTIAL LAW.)

Military Law, a branch of the general municipal law, consisting of rules ordained for the government of the military force of a state government, equally in peace and war. (See LAW, MILITARY.)

Moral Law, a law which prescribes to men their social duties. The moral law is summarily contained in the decalogue, written on two tablets of stone and delivered to Moses for the Israelites on Mount Sinai. (Ex. xx.) (See MOSES.)

Mosaic Law, the institutions of Moses, or the code of laws prescribed to the Jews, as distinguished from the Gospel.

Municipal Law, a rule prescribed by the supreme power of a state, declaring some right, enforcing some duty, or prohibiting some act; a statute; a collection of rules to which men living in civic society are subjected in such a manner that they may in case of need be constrained to observe them by the application of force. (See GOVERNMENT.)

Parliamentary Law is the name given the rules and precedents regulating the procedure of deliberative assemblies. Certain rules of parliamentary procedure have always been necessary for the accomplishment of the purposes for which deliberative assemblies are called. Experience has shown that restrictions must be placed on individual members in the general interest of the whole body; that mere customary rules are insufficient, and hence regular parliamentary codes must be prepared for the government of deliberative assemblies. In both England and the United States parliamentary law has become almost a distinct branch of the law, and its mastery is highly essential to the success of the legislator. The necessary officers of a deliberative assembly are a chairman, usually called speaker, president, or moderator, and a secretary or clerk. It is the duty of the presiding officer to call the meeting to order; to state clearly all questions brought before the assembly; to put motions properly made and in their proper order; to preserve order and enforce the rules of procedure; and decide questions of order subject to the right of appeal to the whole assembly. These are his primary duties, but he may in addition participate in debate, as any other member, and vote in case of a tie. It is the duty of the secretary to keep a record of the proceedings of the meeting, including a correct statement of every motion made and the manner in which it was disposed of; the names of members of all committees appointed; a true copy of every resolution passed with the affirmative and negative votes cast therefor, etc. (See PARLIAMENTARY LAW.) For rules governing debates, motions, appeals, etc., consult Cushing, ‘Manual of Parliamentary Practice,’ and Roberts, ‘Rules of Order.’

The Courts and Law Practice.— For a general survey of judicial proceeding and the methods of courts, see the articles, COURT; JUDGE; JURY; JUSTICE. In the practice of law, especially during the 19th century, many new and distinct phases of legal classifications have arisen, such as Corporation Law, Pension Law, Law of Husband and Wife, Divorce Law, the Law of Negligence, the Law of Copyright, Election Laws, Insurance Law, Mining Law, Liquor Laws, Bankruptcy Laws, etc. These are generally treated under their respective titles.

Plaintiff and Defendant.— The parties to an action in law are called plaintiff and defendant, and the former is said to sue or prosecute the latter, hence the word suit instead of action. In some few instances the redress sought by a civil action consists in the recovery of some specific article of property wrongfully and unlawfully taken by the defendant from the plaintiff, but most frequently the object of an action is to obtain compensation in money for an injury complained of, which compensation is technically called damages. The action is said to terminate properly at judgment. Civil actions are those actions which have for their object the recovery of private rights, or of damages for their infraction. Criminal actions are those actions prosecuted in a court of justice, in the name of the government, against one or more persons accused of a crime. Transitory actions are those civil actions the cause of which might have arisen in one place or county as well as another. Local actions are those civil actions the cause of which could have arisen in some particular place or county only. Personal actions are those civil actions which are brought for the recovery of personal property, for the enforcement of some contract, or to recover damages for the commission of an injury to the person or property. Real actions are those brought for the recovery of lands, tenements, and hereditaments. Mixed actions are those which partake of the nature of both real and personal actions. (See DEFENDANT; PLAINTIFF.)

Law of Evidence.— Evidence in law may be oral or documentary. Oral evidence is the statements made by witnesses during a trial; and documentary evidence consists in the production of papers, on which is writing, marks, or characters capable of being read, which are submitted during the course of the trial. Oral evidence must in all cases be direct; if it is of something that was seen, by the person who saw it; if of something heard, by the person who heard it; if of an opinion, by the person who holds that opinion; or if the knowledge was acquired in any other manner, by the person who perceived it in that manner. The general rule is that hearsay evidence is not admissible. Documentary evidence may be either primary or secondary. Primary evidence of a document is where the document itself is produced for the inspection of the court. Either oral or documentary evidence may be given of any fact in issue or relevant to the issue. (See EVIDENCE.)

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Law, American Schools of. Among the notable features of educational progress in the United States during the 19th century, there was, possibly, none more remarkable in scope or destined to exert weightier influence upon the future of the nation, than the marvelous increase in number and growth in importance of our American schools of law. That this statement is conservative rather than extravagant is demonstrated by the fact that while at the opening of that century there existed in our nation but a single professional law school — and that a private enterprise which never conferred a degree — at its close, more than one hundred publicly chartered academic institutions were given official recognition as such by the national commissioner of education.

And the American school of law is to-day an institution peculiar to itself, for the reason that there existed in the mother country from which our common law and so large a proportion of our earlier statute law, as well as the formal machinery of our administration of justice, were derived, no similar scholastic organizations which could serve as models in the development of a system of instruction in jurisprudence.

Among the continental nations of Europe, of course, and particularly among races of Latin derivation, schools of law had been firmly established from a period of remote antiquity and were held in exalted importance.

Thus, great schools of jurisprudence flourished, long prior, even, to the time of Justinian, at Berytus, Rome, and Constantinople, and became especial objects of the sedulous watch, care and protection of that great emperor to whose enlightened supervision the Roman law owed its systematization and codification at the hands of Tribonian and his colleagues. Although, in the earlier period of Roman history and under the Republic, the youthful student who aspired to master the principles of jurisprudence usually attached himself to some lawyer of prominence from whose discourse and practice he might acquire the desired knowledge, this custom became obsolete to the degree that, under the emperors, nowhere in Rome's vast domain, outside of these three schools, of which the Sidonian was pre-eminently the most famous and successful, was professional instruction in law permitted to be given.

The impetus given by these law schools of antiquity, not alone to the study of legal principles but to the cause of learning in all branches, was incalculable. And, similarly, the renaissance of modern education has been justly held to date from the successful effort of Irnerius, at the dawn of the 12th century, to revive scholastic interest in the juridical learning of the civilians. This notable scholar and teacher, himself an alumnus of Constantinople, by the establishment, under the auspices of Frederick I. of Germany, and at the suggestion of Hildebrand's friend, the Countess Matilda, of his wonderfully successful lectureship on the *Corpus Juris Civilis*, provided the actual nucleus around which was eventually assembled the great university of Bologna, forerunner of all modern institutions of the kind.

But such was the history of the growth of the English common-law that slight parallelism existed between the methods by which instruction in its principles and practice could be gained by the neophyte and those open to students of legal science in continental countries and especially among peoples whose jurisprudence was derived from or dominated by the elementary fundamentals of the Roman civil law. Thus, while elaborate and erudite courses in the history and principles of jurisprudence, ancient and modern, including both the canon and the civil law, have for centuries figured prominently in the curricula of the two great English universities, neither the highest proficiency in their scholarship nor any degree in law conferred by Oxford or Cambridge ever led to the bar in England. On the contrary, the wardship of the door to the practice of the legal profession in our mother country has ever been in the keeping of the Inns of Court, curious bodies politic which, while neither hostelries nor seminaries, partook in some respects of the nature of both, and have remained the peculiar custodians of instruction in the arcana of common-law practice and pleading.

Whether or no acceptance be accorded to the view of that eminent American jurist and legal educator, Judge Simeon E. Baldwin, that the unsystematic texture of the common law was less friendly to its pursuit as a scholastic exercise, acquiescence must be full and unreserved in his conclusion that the absence of English law schools in modern times left America no guide in this direction; and that, great as seems the present measure of her success, whatever our country has done she has done for herself, slowly, painfully, with hesitating and uncertain step.

To Tapping Reeve, lawyer, judge and legal writer of eminent distinction, belongs the honor of establishing the first American law school, at Litchfield, Conn., in 1784. Judge Reeve, a graduate of Princeton in the class of 1763, had settled in the practice of law at Litchfield as early as 1772, and had married a sister of Aaron Burr, who was an early student of law under him and an inmate of his household. Under the able guidance of its founder, who remained its sole instructor until his elevation to the judgeship of the Superior Court of Connecticut, in 1798, the Litchfield Law School speedily gained a widespread and favorable reputation. Upon his assumption of the duties of the bench, Judge Reeve associated with himself in the conduct of the school James Gould, the well-known legal author and jurist. The Litchfield school, though, as has been said, never conferring a degree, maintained a successful career for a round half century, and during its existence numbered more than one thousand students upon its rolls. Of its thousand alumni, some forty rose to be justices of courts of last resort in the States of their various residences, while others reached positions of eminence as legislators in both houses of Congress. To the experience of its founder and his colleague in this pioneer school, American students and practitioners of law unquestionably owe the production of two valuable and important text-books, each of which for more than half a century remained a standard of authority in its line. These were Judge Reeve's treatise on the 'Law of Baron and Feme; Parent and Child; Guardian and Ward' (1816), familiarly known as Reeve on Domestic Relations; and Judge Gould's masterly work on 'Common Law Pleading.' In passing, mention should not be omitted of the second proprietary or private law school in America which was that founded at Northampton, Massachusetts, in 1823, by Judge Samuel Howe and Mr. E. H. Mills, a lawyer, who later became a federal senator. The Northampton School, however, had but a brief existence of six years, and its attendance was never large.

Coming now to the question of the establishment of regular academic courses of instruction in law in publicly chartered institutions, while a professorship in English law had been established, largely through the efforts of Thomas Jefferson, in the ancient college of William and Mary in Virginia in 1782, the earliest course of collegiate law lectures ever given in America was that delivered in 1790 by Justice James Wilson, of the Supreme Court of the United States, as incumbent of the chair of Law in the College of Philadelphia, the institution founded by Benjamin Franklin, and merged in 1792 in the University of Pennsylvania. Auspicious circumstances attended this opening of American collegiate instruction in law, the lecturer being not only one of the best read and most deeply learned lawyers of his time, but, by reason of his distinguished record as a signer of the Declaration of Independence, and a member of the Constitutional Convention of 1787, a van-leader of public thought and action. In deference, we may suppose, to his high dignity as a member of the Federal judiciary, his introductory lecture on 15 Dec. 1790, was attended by a brilliant concourse of public officials, including the President of the United States and his Cabinet, as well as the Governor of Pennsylvania, members of congress and of the State legislature. But the course, or rather series, for Judge Wilson delivered three courses of lectures during that academic year, ended with its close; and no further instruction in the subject was attempted in the University of Pennsylvania until 1817, when law lectures were once more given during the period of a single year; following which came another interval of total inactivity in that institution lasting until 1850.

In New York, the history of academic legal instruction began with the appointment of James Kent, in 1793, to a professorship of law in Columbia College, his first course of lectures being delivered to a small class, during the following year, and suceeding courses in 1795 and 1797. Owing to the slight attendance, however, he resigned the chair in 1798, upon his accession to the bench of the Supreme Court of New York, of which he became chief justice in 1804. In 1823, at the age of sixty, having served in the previous year as a member of the convention to revise the State constitution, and having been chancellor of New York since 1814, he retired from the bench and was re-elected to his former chair at Columbia. The incalculably valuable service which he had rendered to the cause of American jurisprudence and especially to the administration, development and extension of equitable jurisdiction, he now supplemented by elaborating his learned and lucid lectures into those incomparable commentaries on American Law in four volumes (1826-30), which for more than three quarters of a century have remained for the lawyers of our country as solid and standard an authority of reference as were the works of Coke and Blackstone to English practitioners. Attendance upon the chancellor's lectures appears, however, to have been perfectly voluntary with the student body, no regular law course being prescribed, no examinations on the subject being held and no degrees in law conferred. In point of fact, no department of law appears to have been regularly organized at Columbia until 1858; and it seems that prior thereto no law school existed in New York city.

Eldest of existing American law schools organized as such is the Harvard Law School, which was established in 1817. While it is true that as early as 1779 Isaac Royall, a Massachusetts citizen, then resident in London, had bequeathed property to Harvard College for the establishment of a chair of law, the fund did not become available until 1815, and the duties of the incumbent, up to the time of the appointment of Hon. Asahel Stearns as university professor of law in 1817, consisted merely in the delivery of 15 lectures annually to the senior class in the college. Prof. Stearns remained 12 years at the head of the law school, and it may justly be said with every desire to render due credit to this distinguished and faithful instructor that they were years of small beginnings and of little advancement for the institution. The Litchfield School enjoyed such a high repute that it easily attracted a far larger and more enthusiastic attendance, while even the Northampton school was a dangerous rival. In 1829, however, a new phase was placed upon the condition and prospects of the Harvard Law School by Hon. Nathan Dane's generous donation of $10,000 for the endowment of a new professorship of law, coupled with his request that Mr. Justice Story, of the United States Supreme Court, Marshall's great coadjutor and the only one of his associates who fairly divides with him the fame of the early administration of that mighty bench, be appointed the first Dane professor.

Simultaneously, John Hooker Ashmun, then head preceptor of the Northampton School, was tendered the chair of the Royall professorship. The average of attendance at the Cambridge school had then sunk to that of a single student, but upon the acceptance of its headship by Judge Story a revival of interest was manifested and the close of his first year's administration saw in the neighborhood of 30 pupils enrolled. The Northampton school immediately ceased to exist and the Litchfield school was abandoned four years later. Prof. Ashmun's death in 1833 was followed by the election, as Judge Story's colleague, of Simon Greenleaf, an advocate of eminence, the first official reporter of the decisions of the Supreme Judicial Court of the State of Maine, and the distinguished author of that treatise on the law of evidence which at once became, as it has since remained, a standard of authority in all countries ruled by English law.

The Yale Law School is second in age only to that of Harvard, and, while ordinarily spoken of as established in 1824, practically dates from the appointment in 1826 of Hon. David Daggett, a judge of the Superior Court of Connecticut, to the professorship of law in the college,—a chair which had been established, indeed, as early as 1801, under the presidency of Rev. Dr. Timothy Dwight, and had been previously administered by the Hon. Elizur Goodrich, but merely as a lectureship on the leading principles of legal science with no view to qualifying students for the bar. Prof. Daggett, however, had been, up to the time of his appointment, associated with a leading advocate, Samuel J. Hitchcock, in the conduct of a private law school in New Haven, and, under his supervision, the Yale department of law speedily took shape as a practical law school.

In 1833, graduates of the Litchfield school established a law school at Cincinnati, and similar schools were founded at Louisville, Ky., in 1846, and at Lebanon, Tenn., in 1847. The number of American law schools, prior to 1850, was thus extremely limited and the aggregate attendance upon their courses was correspondingly small.

Twenty years later, in 1870, the number of law schools had increased to 28, with an aggregate attendance of 1,653 students. In 1880 there were 48 schools, serving 3,134 students; in 1890, 54 schools with 4,518 attendants, and in 1901 the number of schools had reached one hundred, with more than 13,000 pupils enrolled. The report of the United States Commissioner of Education for 1902 gives statistics of attendance at 102 law schools of a total student body numbering 13,912, of whom 165 were women. The distribution of these schools among the various States was as follows: One each in Alabama, Arkansas, Connecticut, Florida, Kansas, Louisiana, Maine, North Dakota, Rhode Island, South Carolina, Washington, and West Virginia; two each in California, Colorado, Kentucky, Michigan, Mississippi, Nebraska, Oregon, Texas, and Wisconsin; three each in Georgia, Iowa, Maryland, Massachusetts, Minnesota, North Carolina, and Virginia; four in Pennsylvania; five in Missouri; six each in the District of Columbia, Indiana, and Ohio; eight each in Illinois, New York, and Tennessee. The significance of this vast and rapid growth may perhaps be more readily grasped when one remembers that from 1875 to 1899, the number of students enrolled in professional schools in the United States increased as follows: In theology, 58 per cent; in medicine, 177 per cent; in law, 343 per cent.

In 1902 there were 148 American schools of theology, with an attendance of 7,343 students, a decrease of 224 students from the number of the previous year, while the number of students in the 102 law schools had increased 270 over that of the preceding year, rising from 13,642 to 13,912.

At 55 law schools, the course essential to graduation covers three years; at 38, a two-years' course leads to a bachelor's degree, while five institutions in the Southern States have only a one-year course. Under the influence of the section on legal education of the American Bar Association, a constant and gratifying advance in the standard of instruction and in the lengthening of the course for the bachelor's degree in American law schools is to be noted. In 1890, only eight schools required three years' attendance for the bachelor's degree, while eight years later progress in this direction had been so great that no less an authority than Joseph H. Choate, in the annual address delivered before the American Bar Association, did not hesitate to declare, "The standard of legal education has never before been advanced to its present height. The young men who come annually from the law schools to recruit our ranks, are better equipped and qualified — far more so, than we ever were — to enter upon the arduous and responsible duties that await them."

The marked elevation in the requirements for admission to American schools of law is shown by the fact that while, prior to 1877, no entrance examinations were prescribed in any of them, and so late as 1890 there was but a single institution demanding a demonstration of precedent educational attainments equivalent to the requirements for college matriculation, nearly one half of the recognized law schools of this country now deny admission to applicants except upon terms that would practically secure their entrance to the average college of liberal arts. The highest standard of admission is that prescribed by Harvard, which for some years past has refused to admit, as candidates for degrees of law, students not holding the degree of bachelor of arts, conferred by some college of recognized standing. In this position, the Cambridge authorities have been followed, not without great hesitation and well-founded reluctance, by Columbia. The strongest objection to such a requirement may be summed up in the statement that, there being no necessary correlation between the courses of study pursued by various students in different institutions leading up to the academic degree, its possession is not strong evidence of any special equipment for the pursuit of legal studies; and that the object aimed at might be better and more directly attained by the establishment of entrance examinations at the various schools of law sufficiently comprehensive in scope and exhaustive in character to establish the applicant's fitness to enter intelligently upon the study of the principles of law. Ninety-seven schools, with an enrolment of 8,464 students, constituting the Association of American Law Schools, have united in the uniform requirement that each school belonging to the association shall maintain an entrance examination equivalent to that required for graduation from a high school.

It is a matter of singular interest that with the steadily advancing standard of entrance requirements, there has followed an almost equivalent decline in the importance of a diploma of graduation from a law school as a factor in securing admission to the bar. Formerly, in many jurisdictions, such a diploma was by statute an immediate passport to the practice of the profession, but with the stiffening of the educational requirements demanded of the law student there has most fortunately concurred a quickening of the conscience of the courts as to their duties and responsibilities in the premises; with the result that the sound judgment of lawyers and legal educators has been gradually led to endorse the proposition that it is neither logical nor desirable for schools of law in no way subject to the supervision of the courts to possess the unrestricted power to create officers thereof. The influence of the American Bar Association and its junior organization, the Association of American Law Schools, has for some years been steadily and wisely directed to securing the abolition of the exercise by law schools of this power, which should properly be exercisable only by the courts. While there can be no doubt of the eventual establishment of this reform universally, a law school diploma still admits to the bar in the States of Alabama, Georgia, Kansas, Louisiana, Michigan, Mississippi, Missouri, Pennsylvania, South Carolina, Tennessee, Texas, West Virginia, and Wisconsin.

In many of the States this matter has now been wisely regulated by placing the matter of admission to the practice of law exclusively within the jurisdiction of State boards of law examiners, the members of such boards being usually appointed in rotation for fixed terms by the justices of the highest appellate courts of the respective States.

As the American school of law was practically compelled to construct its own road to success, it is not unnatural that there should have arisen considerable divergence of opinion and of practice in the matter of methods of instruction. Roughly, it may be said that three systems have prevailed: a system of instruction by lectures and dictation; a system of instruction by the study of and recitation from prescribed text-books of authority; and a system of instruction confined largely to the reading and expounding of selected cases of leading importance, indicated by the instructor, through which the student is encouraged to delve for a mastery of the principles involved. The latter method, first generally introduced on a scientific basis by Prof. C. C. Langdell, Dane professor of law at Harvard, and since greatly elaborated by his colleagues, Professors James Barr Ames, Joseph H. Beale, Jr., and Samuel R. Williston, as well as by Prof. W. A. Keener, of Columbia, and Prof. Ernest Huffcutt, of Cornell, may be justly considered the prevailing system in our law schools of to-day, although justice requires the statement that none of these methods is or ever has been exclusive of the others, but rather that the curriculum of every well-directed law school in the present, as in the past, has ever included a greater or less proportion of attention to each of these systems.

No review of the history of American law schools would be just or complete which failed to note the remarkable debt under which the practice and the administration of law in this country has been placed by the contributions to legal literature made by members of their various faculties in the form of standard text books, usually, if not universally, the outgrowth of carefully prepared courses of lectures primarily designed solely for the guidance of their student bodies. Reeve's on ‘Domestic Relations,’ Gould on ‘Pleading,’ and Kent's ‘Commentaries on American Law’ have already been instanced. Story's treatises on the ‘Elements of Constitutional Law’ and on ‘Equity Jurisprudence’; Greenleaf's exhaustive summarization of the law of evidence; and Parsons' great work on the ‘Law of Contracts’ constitute three monuments of this sort which alone would reflect imperishable renown on the Harvard Law School, could it point to no other ground of claim to its present distinction. And an interesting parallelism subsists between the facts that, as it was the donation to Oxford by Viner of the profits of his compendious abridgment of English law which furnished the foundation of the Vinerian professorship, the first and greatest fruit of which was the elaboration by Sir William Blackstone of his course of lectures into the imperishable ‘Commentaries on the Law of England,’ so it was the donation to Harvard by Dane of the profits of his later abridgment of law which directly stimulated the production of Joseph Story's masterly work on ‘Equity Jurisprudence.’

Other notable instances of legal authorship in point are the great work on ‘Constitutional Limitations,’ by Judge Cooley of the law school of the University of Michigan, the elaborate and finished analysis of private international law by Prof. Raleigh C. Minor of the University of Virginia, and the learned exposition of the ‘Law of Estoppel’ by Prof. Melville M. Bigelow, of the ‘Law of Wills and Administration’ by Prof. James Schouler, and of the ‘Law of Wills’ by Prof. George Enos Gardner, of the law faculty of Boston University.

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Law, Canon, the body of laws or rules laid down by the canons for ecclesiastical government, and known as the «Corpus Juris Canonici.» All civil or religious communities, as soon as they come into existence, require governing rules, and those first promulgated undergo modifications, additions, and other development, so long as the community is in existence. Thus, in the early rules of conduct set forth by the Apostles are found the germs of canon law, which attained its fullest development when the papal power was at its height. The oldest canons are called Apostolic canons. The fully developed canon law of the Roman Catholic Church, exalting the ecclesiastical over the civil power, was generally antagonistic to all European temporal rulers, and in England, Henry VIII., by a revision of canon law, left only those parts of it binding which were not opposed to the common or statute law. See Canon Law.

Law, Civil, the laws regulating a country, state, or city, and the term generally used to designate the «Corpus Juris Civilis» or whole body of Roman law, with the numerous modifications which have been made by the different countries in which this body of law has been adopted. The Corpus Juris Civilis dates from the origin of the Roman state, and developed with its growth until the whole collection of laws was gathered by command of Justinian, in the Institutes, Code, Digest, and Novel Constitutions. The most famous modern parallel to Justinian's codification is that of the code promulgated by command of Napoleon I. See Civil Law.

Law, Commercial, the system of law, the «Lex Mercatoria» or «Law of Merchants,» regulating mercantile transactions between merchants belonging to different countries, or merchants generally. It is derived from the customs of merchants, from the imperial code of Rome, the different maritime codes of ancient Europe, and from international law. See Commercial Law; Law — *Law of Merchants.*

Law, Common, in America. The layman who diligently searches the statute books of our several States must not flatter himself that he has so determined his own, or the legal rights and obligations, of his fellow citizens, and, upon that misapprehension, set forth upon such litigious adventures as this assurance would surely provide for him. He may have heard of the common law, and have thought it an obsolete system of jurisprudence, affording an interesting and curious field of study for the antiquarian, but as an active power supplanted entirely by modern statutes, which he assumes to present the whole body of the operative, substantive law. To warn the over-confident student against the consequences of such error, this article may, to some extent, serve a useful purpose. It is intended, however, to set forth briefly, without technical analysis, and in entirely popular form, the origin, development and present influence of that system of administrative law known both to laymen and to the profession under the title of the Common Law; the spirit, the forms and phrases of which still appear in our legislation and in the judicial utterances of the courts of every State of our Union save, perhaps, Louisiana, whose laws have their source in, and take their inspiration rather from, the Code Napoleon, which, in turn, was an offspring of the Roman law. With this exception, and except in the jurisdiction of the Federal Courts of the United States, the principles of the common law have within our Union full vigor and dominion, excepting, always, as they have been expressly modified or annulled by legislation. But even statutes are to be construed in reference to the common law, for it is not to be presumed that the Legislature intended to make any innovation upon the common law further than the case absolutely required, and this rule of construction has been held applicable to acts of Congress, though there is no common law of the United States (Kent's Commentaries, Vol. I., p. 464). The common law must, nevertheless, be invoked in the matter of construction of Federal statutes, for, though its jurisdiction is not conferred upon courts of the United States, where the statutes do not so provide; their powers are purely statutory, but, in their exercise, the Federal Courts give full recognition to the rules of the common law. The same oversight by the common law over legislation was long ago declared by Lord Coke, who held that the common law «doth control acts of Parliament and adjudge them void when against common right and reason.»

Even to-day the most important personal or property rights of the citizen may be determined in our courts upon the authority of some ancient decision recorded in the Year-Books, yet having the same force now as at the time of its enunciation centuries since. And it may further be safely affirmed that no one of the fundamental propositions of the common law relating to the liberties of the citizen, has been wholly abrogated by legislation, the changes in the body of the law by this process having been more by way of development than excision. The sources in which this ancient, but still vigorous, system had its origin are to be sought in a past older than the recorded history of our English ancestors, or of their progenitors. Most of the vital principles which animate its substance may be directly traced to those rules of civil government and those stern precepts asserting personal and property rights first declared by the unwritten law, administered by the rude forest courts of the barbarian ancestor of our Saxon and Norman parents, and already established when Cæsar led his victorious legions to the remoter boundaries of Gaul, where, in battle and in treaty, he came to know and respect those sturdy races whose primitive arms and crude laws have developed into, and still actuate, the powers which to-day and for generations have led in the advance of civilization the world over. Born of the rigor and the necessities of their hardy life, reflecting something of their higher aspirations, expressing, it is true, in its inception, the savage principle that made vengeance the impulse to secure the punishment of an evil-doer, or serve to deter one who would do wrong, this system of law has grown with the growth of the people who framed it. As they emerged from savagery, the law moved onward with their progress, and was modified by their enlightenment. The Roman Conquest left the imprint of its civilization and its distinct influence upon the laws of the northern subjects of the empire. So that by the time of William the Conqueror, though the dominant law by which he and followers were governed, and which he brought with him to England, was still essentially that of the German barbarian, there were grafted upon it many of the precepts, and much of the philosophy, of the Roman jurist. The necessities of the people, the teaching of their experience, usage based upon the morality of the time, were the foundations of their system of law; defined by no written code, claiming nothing of the mystery of an inspired origin, human in its every fundamental feature, sustained by the will, the intelligence, and the virtue of the people, from its beginning to the present day, it has had the vitality of human life itself and has survived through all the violent changes and revolutions of religious faith, and has maintained the vigor of its original purpose, the discharge of its intended functions, the establishment of laws for the conduct of human affairs, the determination and protection of personal and property rights, of men, dealing and dwelling with their fellows — without which no society could long endure.

Lord Hale has said that the common law of England is «not the product of the wisdom of some one man or society of men, in any one age, but of the wisdom, counsel, experience, and observation of many ages of wise and observing men»; and that «Time is wiser than all the wits of the world, and the law which has been tried by it, has its highest possible evidence in its favor.»

That system, ancient in the days of Lord Hale's encomiums, approved by the wisdom of the generations who have followed him, is held in obedient reverence to-day, and each succeeeding age has added to its substance and spirit, some contribution of learning, the results of new observations, of new experience, and of new enlightenment.

The bibliography of the common law is as wide as the field of its jurisdiction, and a recital of the volumes in which its precepts are recorded would far transcend the necessary limits of this article, nor would it lie within the scope of its intent. The subject has engaged the profound study of scholars, inspired the decisions of most learned judges, and by the evidence of its influence historians have traced the progress of nations. Its commentators have uniformly extolled its wisdom, its beneficence, and its unparalleled power, some even in their earnestness having used those reverential phrases which are appropriate to the Holy Scriptures themselves.

«The judges,» Chancellor Kent has told us, «through the whole period of the Year-Books, were constantly urging the sacredness of precedents, and that a counsellor was not to be heard, who spoke against them; and that they ought to judge as the ancient sages taught.» «If we judge against former precedents,» said Prisot, C. J., «it will be a bad example to the barristers and students at law, and they will not give any credit to the books, or have faith in them.»

This adherence to precedent has characterized the slow and conservative development of the system, even to our own time. It is still true that when no statute has expressly abrogated a rule of the common law, it remains the supreme law of our courts, if the facts and circumstances of the particular case make it applicable, even though the source of the rule must be sought in the conflicts of the Saxon sullenly defending his rights against the arrogant Norman baron, or in the controversies of the astute churchmen, who, in spite of hostile statutes, by ingenious turns of argument and construction, defended in the courts lands which they could no longer hold by arms.

A well-considered decision of Chief Justice Holt, Lord Coke, or in later times of Lord Mansfield, has to-day and in our country, all the authority it had when it first fell from the lips of the austere judge and terminated a controversy between litigants whose dust has long since mingled with the English earth. Our courts are bound by the letter no less than by the reason of the adjudication. They must not overrule a decision plainly in harmony with the principles of the law which demanded it, for the function of the court is exclusively judicial, and it may not, because of the apparent hardship of a particular case, usurp legislative power. If the rigor of a rule of the common law bear too hardly upon the citizen, or if it be in conflict with the conscience or conditions of the present day, legislative relief is a sovereign and effectual remedy, and is that which the common law has itself wisely provided, to meet changing conditions and circumstances.

The recorded evidence of the principles of the common law, to which the judges turn for guidance in rendering their judgments according to that law, is preserved in a multitude, ever increasing in numbers, of reports of decisions: first, of the Courts of England, the earliest of which are the Year-Books, black-letter tomes written in crabbed law French, seldom read to-day even by the most studious lawyers, because most of the decisions there recorded have passed by comment and reference into later works, but the decisions themselves are none the less active living factors in the law of to-day. These early reports cover a period of about two hundred years, from the reign of Edward II. to that of Henry VIII. From that time forward, with some early intermission, but later continuously, the adjudications of the English courts of high authority have been carefully, and, for the most part, accurately preserved, and these volumes, with the acts of Parliament, make up the body of the common law as it existed when the American Colonies declared their independence, and as it has been incorporated into our own jurisprudence. The ancient reports are instructive not alone for the letter of the decisions of the judges, but also because they are almost the only written records of the law; the text-books,—indeed, the writers competent to prepare them,—less then than in our time, and in many instances, the annotations of the reporter, are the only statements of general legal principles and have the same weight of authority as the judicial decrees because they reflect the real genius of the law itself.

Lord Coke, Chief Justice of the King's Bench in the time of King James, is a notable illustration of this service to the law. His observations, deduced from the decisions in favor of the rights of the subject, and in restraint of royal prerogative, so angered that monarch that he removed the Chief Justice and directed that his commentaries be eradicated from the books, but that which Coke wrote is the law to-day, and the king who would have stayed its progress, might, indeed, be now forgotten except for this impotent effort, which gives him immortality beside King Canute, who, by his royal will, sought to hold back the waves of the limitless sea. This memorable incident of Lord Coke well illustrates that quality of the common law which has enabled it to survive all changes of dynasties and of nations. Royal ambition, popular violence, religious fanaticism, even the tumult of civil war, could not, except momentarily, change the tenor of its way or obstruct its constant advance toward the establishment of a stable, permanent system of justice. Flexible, and adaptable in its external forms, it absorbed in each period of its transition only those elements which were of permanent value. It never retrograded.

Of the ancient law of England, «planted here by the Conqueror,» Lord Bacon, when entertaining the vain ambition that he could by his own genius embody all its vital principles within the fixed terms and phrases of a code, said, with rare vigor and felicity of speech: «Now of the laws of England, if I shall speak my opinion of them without partiality either to my profession or country, for the matter and nature of them, I hold them wise, just, and moderate laws, they give to God, they give to Cæsar, they give to the subject, what appertaineth. It is true they are mixed, as our language, compounded of British, Roman, Saxon, Danish, Norman customs; and surely as our language is thereby so much the richer, so our laws are likewise by that mixture the more complete.»

Purified, invigorated, by the best thought and by the experience and intelligence of the generations since Bacon lived, the common law of America, imposed upon us by no «Conqueror,» but brought here as their birthright by our fathers, zealously and jealously guarded, and sacred to them as their religion itself, immortal in its vigor and virtue, speaks to-day the very conscience of the state.

It remains only, for the purposes of this article, to briefly trace the processes and channels by which it has become the predominant law of America, wherever the Saxon race has inherited, or after his manner, taken possession of, the earth. If we have in mind our English origin, we shall readily understand why in the deeds by which our lands are conveyed we note a phraseology which had its occasion in feudal tenures, or mark the last struggles of the Roman Church for temporal possession, and why in the courts we still hear the technical words of the pleader used in ancient Westminster Hall, and why we observe the precise and often quaint verbiage of indictments upon which a prisoner is set to trial for his life, to which, indeed, the modern prosecuting officer still adheres with almost superstitious fidelity. Brought over seas by our English ancestors, as the law of England, it, of course, was our law through the Colonial period, and when our conflict with the mother country became inevitable, our patriots invoked the common law, the heritage of all English subjects, as the justification for their action. Their defiance of unconstitutional taxation was not the outbreak of Englishmen reverting to barbarism in the wilds of a new country, or of men impatient of the restraint of just laws, nor was it the outcry of some rabid revolutionary philosophy taught by an alien race, for it was to the constitution of England, embodied in her common law, that the colonists appealed to a king and ministry who had themselves forgotten its precepts. The arguments of the freemen of Virginia or of Massachusetts were the same with those uttered by the liberal nobleman or commoner in the Parliament of England, and the triumph of our revolution was no less a victory for the common law than for the exhausted Americans who had offered their lives and their fortunes to the defense of the principles it had inculcated. Here, again, a king had thought his will more potent than the law, and here again the royal prestige and prerogative met humiliating defeat before the resistless moral force of the law, that had made the people's rights and the constitution the dominant power of government, rather than the arbitrary will or ambition of the sovereign. So sacred to every colonist was this law that in the first intimation of organized resistance to England in the resolutions of the Convention of 1774, it was declared that the colonists were of right entitled to the benefit and protection of the common law of England, and, as well, to that of the acts of Parliament existing at the time of colonization. As the common law had taught our fathers how to win their independence against a tyranny that ignored it, in gratitude, and seeking the preservation of their liberties through its precepts, it was embodied in the constitutions of the new states, where, proof against the vacillation, the passion, or the precipitate action of popular excitement, it should remain, the impregnable fortress, the last sanctuary, of the liberties of the people.

Through the blood of our ancestors, and by rightful inheritance, the common law is our birthright, which scarce needed, therefore, formal adoption by legislation or by the courts. But, that of record it might appear to all men, and be gainsaid by none, it has been inscribed upon the pages of our written law. The Constitution of Massachusetts declares (Article VI. of Chapter VI.): «All the laws which have heretofore been adopted, used, and approved in the Province, Colony or State of Massachusetts Bay, and usually practised on in the courts of law, shall still remain and be in full force, until altered or repealed by the legislature; such parts only excepted as are repugnant to the rights and liberties contained in this Constitution.» Like provision was made in the constitutions of the other original States. The constitution of those States, not existing as colonies, embody by reflection like safeguards for the popular liberty and right, and all directly traceable to the body of liberties of the common law.

The courts, pursuant to the requirements of the constitutions, have declared their perpetual allegiance to the principles of the ancient law. A typical illustration is found in Commonwealth *v.* Knowlton (reported in 2 Mass. Reports, p. 530), where the Supreme Judicial Court declared that «our ancestors, when they came into this new world, claimed the common law as their birthright, and brought it with them, except such parts as were judged inapplicable to their new state and condition. The common law thus claimed was the common law of their native country as it was amended or altered by English statutes in force at the time of their emigration. These statutes were never re-enacted in this country, but were considered as incorporated into the common law. Some few other English statutes passed since the emigration were adopted by our courts and now have the authority of law derived from long practice.

So much, therefore, of the common law of England as our ancestors brought with them, and of the statutes then in force, amending or altering it,— such of the more recent statutes as have been since adopted in practice, and the ancient usages aforesaid,— may be considered as forming the body of the common law of Massachusetts, which has submitted to some alterations by the acts of the provincial and state legislatures and by the provisions of our constitution.»

Again, the Massachusetts court, in Commonwealth *v.* Churchill (reported in 2 Metcalf at p. 118), held that the constitutional provision above referred to was to be «construed as adopting the great body of the common law, with those statutes made before the emigration of our ancestors, which were made in amendment of the common law, so far as these rules and principles were applicable to our condition and form of government.» And in the same case the court declared that it was unnecessary to show affirmatively that such rule or principle had been adjudicated before the Revolution, saying that «before the Revolution we had no regular reports of judicial decisions, and the most familiar rules and principles of law — those which lie at the foundation of our civil and social rights — could not be so proved. No, we rely on usages and traditions, and the well-known repositories of legal learning, works of approved authority, to learn what are the rules of the common law; and we have no doubt that these were the great sources to which the above pregnant provision of our constitution refers.»

Though the Constitution of the United States in no words adopts the common law, as part of its composition, its provisions none the less recognize its existence and continuance as the law of the States, with which the National government might not interfere. It was because of a fear that, through the new Federal Constitution, some untried scheme of government might be imposed upon the people and the States, and in order that the old system of law, known and trusted, might still prevail, safe in the will and obedience of those who knew it best, that it was expressly declared that the Federal Government should have in none of its functions any powers save those expressly delegated to it by the Constitution. (*Re* Barry, 42 Fed. Rep., 113, 118, 120.) But, as has been above noted, the Federal Judiciary, trained to the faith of the common law, have uniformly held that even Federal statutes are to be construed in accordance with the principles of that body of law.

So, by the will of the people, wisely and deliberately exercised and manifest by the declarations of our courts and constitutions, the vast and complex, but stable, system of American law, has been builded upon the ancient foundations of the law of England, and the reflecting citizen of the British Empire, though realizing that the prestige of the arms of England was dimmed by the victories of our Revolution, yet is reconciled when he remembers that the same spirit that gave freedom to Englishmen, inspired the American patriots, and that the colonists demanded only that liberty of person and conscience which the common law had taught them was the birthright of all mankind.

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Law, Constitutional, that part of public law which regulates the political organization of a State and so named because usually embodied in a written instrument called a constitution. It is sometimes spoken of as the organic or fundamental law of the State because it is the basis of all other municipal law. It differs from international law in being wholly municipal in character and from administrative law in that it regulates only in a general way, the organization of the government, leaving the details to be regulated by the rules of administrative law. It differs from ordinary statute law both as to its source and method of enactment and as to its content. While statute law is enacted, modified and repealed by the legislature, constitutional law is usually enacted by a constituent convention especially chosen for the purpose while its validity is, in America at least, usually made to depend upon the approval of the electorate, to whom it is submitted by way of referendum. Hence it is commonly said that constitutional law is enacted by the people, whereas statute law is the work of their representatives. This distinction as to method of enactment, however, is not universal. In some States the same bodies which enact ordinary statute law also ordain and alter the body of constitutional law.

This is true in Great Britain, where the Parliament may alter the constitution in the same manner in which it may enact or repeal an ordinary statute. Likewise in France and in Germany the Parliaments may make amendments to the constitution subject only to the limitation that the French Chambers are required to observe certain formalities which they do not observe in passing ordinary statutes, and in Germany an extraordinary majority is required. In Switzerland the people participate directly in the enactment of their constitutional law, not only through the referendum (q.v.) but also through the so-called initiative by which they are empowered to draw up proposed constitutional amendments and submit them directly to the electorate for approval. For the different types of constitutions see the article Constitution.

The distinction between the content of constitutional law and that of ordinary statutory legislation is largely one of degree and in the States of the American Union this distinction is fast disappearing. Among the proper subjects of constitutional law are (1) the structure and powers of the government including a distribution of its legislative, executive and judicial functions, among separate and distinct organs; (2) a definition of the class empowered to participate in the choice of elective officers and the method by which that choice is to be exercised; (3) the determination of the qualifications, duties and privileges of those empowered to hold government offices and mandates; (4) the creation of a sphere of individual liberty — usually embodied in a bill of rights — upon which the government is forbidden to encroach, and (5) provision for a legal and orderly method of making changes in the constitution so as to avoid the risks and dangers of revolution. In addition to these subjects which may be denominated the essentials of a constitution scientifically drawn, it is common to incorporate therein various provisions relating to education, patents, copyrights, the army and the navy, the militia, corporations, public debts, rules of judicial procedure, regulations concerning official salaries, taxation and administration, etc., which according to strictly juristic tests are more properly subjects for statutory regulation. The effect of this practice has been to introduce into the domain of constitutional law a considerable amount of private law, thus derogating from the principle that the constitution should be exclusively an instrument of public law. On the other hand the usual difficulty of amending the constitution so as to adapt it to new conditions and exigencies has made it necessary to deal with certain subjects by statutory legislation, although they are properly matters that should come within the province of constitutional law. Notable instances are statutes for the government of dependencies. Thus the ordinance of the old Confederate Congress of the United States, passed in 1787, for the government of the Northwest Territory, the various statutes for the organization of the other Territories of the United States, the acts for the government of the Philippine Islands and Porto Rico were of the nature of constitutions of government for the dependencies to which they applied. They were mainly instruments of constitutional public law, although cast in the form of statutes.

A final distinction between constitutional law and statute law is the element of paramountcy which belongs to the former. In all countries where constitutional law is a separate and distinct body of jurisprudence its prescriptions take precedence over all statutory enactments in case of a conflict between the two. In such cases the conflicting statute is said to be «unconstitutional» and is treated as invalid. The power of determining the fact of irreconcilability has been assumed by the judicial branch of the government in the United States and has been so long acquiesced in that the power will probably never be questioned, although it is not expressly conferred by the Constitution. In none of the continental European countries have the judiciaries assumed such power, and in England the «constitutionality» of an act of Parliament can scarcely arise, since that body is legally omnipotent. The rules for the construction of the prescriptions of constitutional law are essentially the same as those for the construction of statutes except that constitutions are more strictly interpreted and constitutional commands are more often construed as mandatory where similar provisions in statutes would be treated as directory only.

In the United States, and in fact in all countries having the federal form of government, there are two bodies of constitutional law, namely, that which is national in scope and that which is local, the former being paramount to the latter in case of conflict. In the United States that part which is federal or national consists of the Constitution «established and ordained by the people» in 1788, including the subsequent amendments thereto, together with the interpretations of the federal judiciary and the usages and customs which have grown up in connection with the administration of the government. Among the important principles which have been developed as a result of judicial interpretation may be mentioned the right of the government to acquire and administer foreign territory, the immunity of the national government, its instrumentalities and agencies from taxation by the States, the right of the government to issue legal tender paper currency both in time of war and in time of peace, the exclusive power of Congress over foreign and interstate commerce, the exclusive power of the States over all matters relating to the suffrage subject to the limitations of the 14th and 15th amendments, the right of the National government to undertake internal improvements, the right of the courts to declare laws unconstitutional, the right of Congress to abrogate a treaty, etc. Among the usages which have become for all practical purposes a part of Federal constitutional law may be mentioned: the ineligibility of the President for a third term, the obligation of presidential electors to vote for the party nominees, the power of the President to remove his appointees without the consent of the Senate, the method of legislation by the committee system, the requirement that representatives in Congress shall reside in the districts from which they are chosen, etc.

Likewise the constitutional law of the individual States is embodied in written constitutions, in most cases prepared by constituent assemblies and approved by the electorate upon referendum, together with the amendments thereto and the interpretations of the State judiciaries. Several of the early State constitutions were prepared and put into effect by the legislatures or by irregular revolutionary assemblies without popular ratification.

With one exception (Delaware), no alteration can be made in any of the existing constitutions without the approval of the people at the polls, and but three of the constitutions now in force were put into effect without ratification by the electorate. The earlier constitutions were brief instruments containing but little more than the law for the organization of the government and the necessary safeguards for the protection of individual liberty, but the later ones are bulky documents containing a vast amount of private law relating to matters which are properly subjects of statutory regulation. This increasing tendency to amplification has resulted from the popular distrust of the State legislatures and the consequent desire to place the regulation of many matters beyond the power of the legislature to alter or repeal it. The effect has been to destroy in a large degree the scientific distinction between constitutional law and statutory law, to retard the constitutional development of the commonwealth, and to add confusion to the task of the student and the practical constitutional lawyer.

In Great Britain the existing body of constitutional law differs in several respects from that of the United States. In the first place it is not so much the result of revolution nor is it so nearly the finished product of a constituent assembly. It is more the product of evolution and growth and is more largely unwritten than that of the United States. Moreover, what is written is scattered through different acts instead of being contained in a single compact instrument. Finally, the Parliament being the chief source of constitutional as well as of statutory law there are no juristic tests upon which a distinction may be founded — a fact which has led Mr. A. V. Dicey, one of the most learned English commentators, to declare that the constitutional law of England is a "sort of maze in which the wanderer is perplexed by unreality." He questions whether English constitutional law is really law, and expresses the opinion that it is only a cross between history and custom, undeserving of the name of law. As the term is used in England, he says, it includes all rules which define the members of the sovereign power and regulate their relations to each other, which determine the mode in which the sovereign power is exercised, which prescribe the order of succession to the throne, which regulate the prerogatives of the chief magistrate, determine the form of the legislature, define the territory of the state, etc. Such of these rules as are enforced by the courts he calls collectively the «law of the constitution.» The others which consist of understandings, habits or practices, and which are not enforced by the courts, he calls the «conventions of the constitution,» or constitutional morality. To the former class belong the rule as to the irresponsibility of the king and the responsibility of his ministers; to the latter belong the rules relating to the executive veto, the initiation of revenue bills and the resignation of ministers. Monsieur Boutmy, a learned French commentator on the British constitution, points out that the principal sources of the constitutional law of England are: (1) Treaties or quasi-treaties, such as the Acts of Union; (2) the common law; (3) solemn agreements, for example, the Bill of Rights; (4) statutes. Of the other European countries the constitutional law (*Staatsrecht*) of Germany is most nearly like that of the United States as to its source, content and dual character. The constitutional law of the French Republic may be dismissed within a sentence. It is embodied in a brief instrument of a few hundred words, contains a bare outline of the organization of the government, does not contain a solitary provision in behalf of individual liberty, and any part or the whole may be altered by the legislature at will.

Bibliography.— Anson, ‹Law and Custom of the Constitution›; Burgess, ‹Political Science and Constitutional Law›; Boutmy, ‹Studies in Constitutional Law›; Cooley, ‹Principles of Constitutional Law›; Dicey, ‹The Law of the Constitution›; Story, ‹Commentaries on the Constitution›; Lebon, ‹Das Staatsrecht der französischen Republic›; Labaud, ‹Das Staatsrecht des deutschen Reiches.›

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Law, Criminal, is the whole body of legal rules and provisions affecting the commission and prosecution of crime. In this article we shall deal only with the general principles of criminal law, as it has also been treated under the titles, COURT; CRIMINOLOGY; LAW; LAW, NATURAL, etc., and under special cases such as MURDER, PERJURY, THEFT, etc.

The theories and doctrines of criminal law are, perhaps, more thoroughly based upon the principles of natural law (q.v.) than any other branch of legal science. The earliest conception of criminal law could not have taken place long after Cain killed Abel, for it seems to rest upon the principle of vengeance, which is born of even animal instinct. The law of retaliation is older than history, and the idea of amendment for every injury is a part of human nature. All the religions in the world's history have never been able to teach men to «turn the other cheek,» but they have always willingly observed the law of «an eye for an eye, a tooth for a tooth.»

The doctrine of criminal law is that the commission of an unlawful act not only requires the guilty person to make proper amendment in some form to the injured party, but that he shall also suffer just punishment at the hands of the state, in order to prevent the repetition of the crime, as well as to make an example him which would tend to deter others from the commission of crime in general. One of the objects of criminal law is to reconcile the rules of procedure with natural justice so as to insure the safe conduct and tranquillity of the state. It embraces the whole body of rules defining the doctrine and the acts of criminal offense; it prescribes for the apprehension of persons charged with crime, the proper procedure for the trial of such persons, and their just punishment when found guilty. Many conflicting views exist among jurists in relation to the interpretation of criminal law, and there is a strong tendency to codify this branch — for instance, in the State of New York the Penal Code defines criminal offenses and provides for punishment, but it is left for the Code of Criminal Procedure to regulate the apprehension and trial of those charged with the commission of crime. Many of the State constitutions and the Constitution of the United States contain what is practically a codification of the laws regulating criminal procedure.

In ancient times and in the Middle Ages the law exercised the right of public vengeance, which had for its chief object the intimidation of the wrongdoer, and resorted to a great variety of grotesque and revolting punishments. The element of example, however, was not wanting, for the most horrible executions, chastisements, and tortures were devised and carried out in public places for the edification of the curious, whose minds must have been impressed with the horrifying spectacles. But in the 18th century a more enlightened jurisprudence opposed the old theory of public vengeance, and advanced the principle of a legitimate defense restrained within the limits of common interest. It was then, for the first time, recognized that the true and right object of criminal law should look to the amendment of the criminal, the amelioration of his condition, and the ultimate restoration to him of the rights of a free man, thus giving back to the world — not a criminal, but a good and useful citizen. From this standpoint, many members of the legal profession are opposed to capital punishment; and some are against corporal punishment, on the ground that it degrades the criminal and deprives him of all sense of pride and ambition, thus permanently unfitting him for making a return to the world of free society. Both in England and in the United States constant efforts are being made to reduce the number of capital offenses.

Everyone is amenable to punishment for crime, with the exception of infants and those of unsound intellect. And this latter exception is limited; it does not prevail in the case of a person committing crime in a lucid interval. Sometimes the fatuity of old age may save a person from punishment, and punishment is remitted in the case of a person who, although not an absolute idiot, is so weak as to be incapable of understanding the difference between right and wrong. Drunkenness is no excuse for the commission of crime, even if it has produced insanity at the moment of committing the crime. But if drunkenness is only the remote cause of the insanity, and the person is not at the time under the influence of liquor or drugs, the law gives him all the consideration that it would give to any other insane person. The cause of the insanity makes no difference; it is the fact *per se.*

A wide latitude in meting out punishment to those found guilty of crime is wisely permitted the judge, on account of the infinite variety of extenuating or aggravating circumstances which surround many cases. It can readily be seen that no code of laws could be made providing for exact or prescribed degrees of punishment, without thwarting the intentions of justice. And so the sentence is left in great measure to the discretion of the Court.

The details of procedure in criminal cases vary to some extent, according to the crime charged, but are substantially the same in all cases. After the warrant of arrest has been issued and the person charged with the commission of crime is apprehended, he is examined before a justice, at which time he may call witnesses in his defense. The justice may, according to his opinion of the evidence, discharge the accused, commit him to jail to await trial, or admit him to bail. The first step in the trial is the presentment of an indictment to the grand jury. The grand jury having been sworn by the judge, and having heard the witnesses, finds a «true bill» if they are satisfied that there is a *prima facie* case. The cause then goes to trial in open court before a judge and jury. The accused is entitled to counsel, and in case he cannot afford to engage counsel of his own choosing, the State (the judge) assigns counsel for him. The first proceeding is the selection of the jury (q.v.). When all of the twelve seats are filled, the jury is sworn and counsel for the prosecution opens the case. He may be private counsel, engaged by the parties bringing the action, but more often is the public prosecutor — the district-attorney. He examines the witnesses for the prosecution, bringing out all the salient points of the accusation. These witnesses are then cross-examined and re-examined under the rules of evidence (q.v.). Counsel for the prisoner then states the defense and examines witnesses, who are in turn cross-examined and re-examined as before. Then comes the summing up, first by counsel for the prosecution, then by counsel for the defense. The judge then sums up the case and charges the jury, instructing them in points of law on which the case may depend. They then retire and bring in the verdict, which must be unanimous. If they bring in a verdict of guilty, the prisoner is either sentenced or remanded for sentence; if not guilty, the prisoner is discharged. If the jury cannot agree on a verdict, they bring in a «disagreement,» and the prisoner is remanded for a new trial. The prisoner has a right to be present during the trial, but should he so conduct himself as to make it impossible to proceed with the case, the Court may conduct it in his absence. The prisoner then has to face the additional charge of contempt of Court. See articles under titles mentioned in first paragraph of this article; also ACCESSORY; COURTS, MILITARY; INDICTMENT; INSANITY; LAW, MARITIME. Consult: Blackstone, ‹Commentaries on the Laws of England›; Archbold, ‹Pleading, Evidence and Practice in Criminal Cases› (1900); Bishop, ‹New Criminal Law› (1900); Harris, ‹Principles of Criminal Law› (8th ed. 1899); Phillips, ‹Comparative Criminal Jurisprudence› (1899).

Law, Customary. See CUSTOMARY LAW.

Law, International. See INTERNATIONAL LAW; AMERICAN DIPLOMACY; UNITED STATES, DIPLOMACY OF.

Law, Natural. Many laws have been found necessary to regulate the conduct of man in his various relations to society which are more or less arbitrary according to the requirements of localized conditions, but underlying them all are the laws of nature.

If a man kill an animal, and eat of its flesh, he has no reason to conceal the act; he goes his way with a full stomach and a clear conscience, and no one charges him with the commission of crime. He has simply conformed to the law of nature and answered the instinct of self-preservation. But if a man kill another man, his whole deportment, and even the expression of his features, indicate the consciousness of guilt and fear. Natural law might be said to be the law dictated by conscience, not law deduced from man's education and experience in the world — law regulating his own general rights and duties in relation to the moral government of God, or Nature, and his own moral capacity and accountability.

So natural law covers a man's duty to God, or Nature — the duties of man toward himself, such as self-preservation, temperance, etc.; the duties of man toward other men, or duties which arise from his relations to others near or dear to him; and finally the duties of man, generally and politically, to universal society, especially to the community in which he lives.

At different periods of the world's history men have had various conceptions of justice. Self-preservation was the basis of law among the Sophists of Greece and the Epicureans; the Stoics believed that natural law was founded upon reason and used the term «rational law.» Aristotle conceived natural justice to be partly legal (made by man) and partly natural (dictated by God).

Natural law, or *jus naturale,* as defined by Roman philosophers and jurists, is that law which is naturally discerned by right reason, as opposed to the law found necessary and made by man for the safe conduct of the state under localized conditions, or by agreement for the preservation of international rights. Later, however, they distinguished *jus naturale* from *jus gentium,* the former being known by Ulpian's definition, «Natural law is that which nature has taught all living things,» and the latter including the laws of expressed or implied agreement between men, or humanistic laws. Aristotle interpreted natural law simply as the law of nations; the Stoic conception was that natural law makes all men free, but that the law of nations permits slavery. The Epicureans thought that commercial trade or profit-making came under natural law. In the administration of Roman justice, natural law was often referred to in justification of an act of judgment, but the validity of a Roman law was never questioned because opposed to natural law.

During the Middle Ages natural law seems to have been considered mostly in its humanistic aspect, that is, in its acquired or necessary application to particular conditions. And in the development of English and Continental law there is seen to exist a stronger inclination to consult the flexible laws of human reason rather than the immutable rules of natural law.

During the 18th century the theories and doctrines of natural law formed an important part of the discussions in relation to jurisprudence, politics, and political economy. This was particularly true in relation to the rehabilitation of the laws relating to liberty, personal rights, property-holding, etc. But in the end utilitarianism played a more important part in the period of legal reconstruction and reform. When jurisdiction passed from ecclesiastical authorities to the people at large, the popular theory that consciousness is the true interpreter of law (consult the writings of Marsiglio of Padua), in spite of its moral allurements had to be suppressed to the extent of eliminating its natural anarchistic possibilities. In England the populace gained the privilege of participating in the constitution of government mainly through the forced recognition of the natural-rights theories which they had long asserted against the crown.

The theory of natural law has ever had its adherents and its enemies. One reaction against it was notably set forth by Hobbes (q.v.). It can be variously construed, according to the philosophical reasoning of the definer. Some one reasons that polygamy is against natural law, another claims that marriage should never exist at all; this one claims that it is natural for man to worship a Supreme being, that one says that all religion is superstition and human weakness, and is not a natural desire. Unless, indeed, we assume that fundamentally all men's consciences are the same, the interpretation of natural law is dependent upon the moral sensibilities of the individual. Consult Holaind, 'Natural Law and Legal Practice.' See JURISPRUDENCE.

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Law, Maritime, a system of established legal rules which particularly relates to the affairs and business of the sea, to ships, their officers and crews, navigation, and to marine conveyances of property. The character and pursuits of marine life, and the commerce related thereto are of a nature peculiar to themselves, and these distinctive features were recognized at a very early period in the history of the civil and the common law, and were noted under the collective term merchant marine.

The ships of a nation are considered as a part of its territory wherever they may wander in the pursuits of commerce. Many of the most important principles of international law grew out of maritime transactions between the various countries of the world, and these principles are as sacred and as rigidly enforced as any of the laws founded upon the comity observed between the different powers. While the great mass of maritime law is the same in all commercial nations, yet in each country peculiarities exist as to some of its rules, and as to the manner in which they are enforced. These differences are owing in a large measure to the municipal laws of the various countries, and as a general rule affect only their own merchants or people in their relations to each other; whereas in matters affecting foreigners the law of the whole commercial world is rigidly observed and enforced. Any nation may adopt its own maritime code but still the mutual relations of commerce and intercourse demand that in all essential things there be a well established and generally observed uniform law founded on natural reason and justice. But every nation reserves the right to make such modifications as locality, the changes wrought by time, and the genius of its people and institutions may demand. The maritime law of each nation may be regarded as distinctively its own; the laws adopted by the respective maritime nations make the basis and groundwork of what is recognized as the maritime law of the world; and the laws of the different countries may have their local distinctions and peculiarities without affecting the general and harmonious integrity of the system, as the differences affect only their own citizens.

The High Court of Admiralty erected in England by Edward III. was of very extensive jurisdiction, embracing all maritime matters. The court has existed ever since in some form, although many modifications have been made. Many of the principles of the English maritime court were adopted by the United States when the separation from the mother country took place, in much the same manner that the English common law was adopted by this country. In the United States the Federal courts, more particularly the United States district courts, have jurisdiction in marine matters, both civil and criminal, the jurisdiction of the latter being original, and that of the Circuit and Supreme courts being appellate only. The jurisdiction of the Federal courts extends to navigable rivers of the United States, whether tidal or not, the lakes, and the waters connected therewith; and it has been decided that the jurisdiction of the Federal courts extends to navigable waters of a river lying entirely within one State. It has also been held that French consuls had no jurisdiction within the States, in matters of admiralty relating to French vessels. It has been conceded by the Federal courts that State laws upon the subject of pilotage conferred upon the State courts concurrent but not exclusive jurisdiction with that of the Federal courts.

It is difficult to conceive of a matter connected with marine affairs which has not been provided for in our marine laws, rules, and regulations, or by the decisions of our courts. On the civil side all matters relating to collisions, freights, charter-parties, demurrage (q.v.), salvage (q.v.), bonds of bottomry and respondentia or hypothecation of ship and cargo, seizure under the laws of impost, prize matters, general average, adjustments, libel for seaman's wages, or libel for other causes, liens for labor or materials, furnished for building or repairs upon marine crafts or for marine works, injuries to seamen, negligence of master or owners, surveys of vessels, towage, wharfage, jettison, marine contributions, dockage, and other kindred subjects are taken charge of and adjusted. Under the civil proceedings one of the most important in extent and complication is the law relating to customs. Through the customs and revenue regulations are derived immense sums of money, as a revenue for government, but an important provision connected with them is a fund which is expended in the maintenance of hospitals for the care of sick and injured marines. The admiralty laws have also a criminal jurisdiction, which extends to all crimes and offenses committed on the high seas, beyond the jurisdiction of any country, such jurisdiction, as generally understood, covering a marine league, or about three miles. The criminal jurisdiction of the United States admiralty court extends to the Great Lakes, as it has been held by the courts that the open waters of those lakes are high seas within the meaning of the statute of the United States. A crime committed on board a vessel in one of our navigable rivers would not give the Federal courts jurisdiction of the offense, but such an offense would be cognizable in the courts of the State within which it was committed. An effort has been made, with a good degree of success, to make the practice in our courts uniform in marine matters, so that an action may be heard and determined in the same manner in one State that it would be in another, without being subject to the great and often embarrassing differences which prevail in the different State courts.

It is one of the chief merits of our marine law that it aims to care for our seamen in all of their relations to the hazardous business in which they are engaged. The term mariner includes all persons employed on board vessels during a voyage to assist in their navigation and preservation, and to aid in the purposes for which the voyage is undertaken. This includes masters, mates, sailors, surveyors, carpenters, coopers, engineers, firemen, pilots, waiters, male or female etc. The term shipping applies to all sorts of craft, whether propelled by wind, steam, or other power. It is true that there are certain rules and regulations which, from the necessity of the circumstances, apply specially to craft propelled by steam which do not apply to those which depend upon the wind to send them forward. The United States Congress has enacted laws by which both steam and sailing vessels are to be built, registered or enrolled, manned, victualed, and navigated. Those laws show a constant aim toward a more humane and enlightened treatment of the common sailor than formerly prevailed, and which in some countries prevails to-day. When an American seaman is discharged in a foreign country even with his own consent, or when the ship is sold there, and her company discharged, three months' extra pay is by our laws required to be deposited in the hands of the American consul for the seaman's benefit. Recent laws have prohibited the infliction upon sailors of corporal punishment, once so common, and which doubtless was sometimes as severe as that described by Dana in his ‹Two Years Before The Mast.› Many other changes in the interest of the common sailors have been enacted by Congress, with a view to promote their health, comfort, and financial welfare. The master of a vessel, often called «ship's husband,» while on voyages at a long distance from the home port, or the place where the vessel is owned, is charged with great responsibility, and he is clothed with an authority commensurate with that responsibility, to enable him to act promptly and efficiently in times of emergency and peril. He has full control of the ship and its cargo. He may abandon the vessel or lighten it by throwing the cargo or some portion of it into the sea. In case of shipwreck from which some portion of the cargo is saved, or the ship brought to land in a damaged condition, in the absence of an opportunity to communicate with the owners, he may sell such property as has been saved from the wreck when prudence or circumstances require it. and he has the right to decide what ought to be done under the circumstances. In case of necessity he may, in the absence of opportunity to communicate with the owners, raise money by bottomry loan on the ship or her freight, or by respondentia on the cargo, or upon them all, by bonds pledging them at a high rate of interest, known as marine interest. Such bonds are to be paid when the ship arrives at her destination or at some designated port. If she does not arrive it follows that the bond is not good and payable. The holder of such bonds acquires an insurable interest in the property so pledged, and may secure his loan in an additional manner by insurance. The master may make contract for repairs upon his ship, when beyond the reach of prompt communication with the owners, and his reasonable contracts so made will be binding upon the owners. It not infrequently happens that serious questions arise as to the necessity for any repairs, or as to the extent of such necessity. Such questions may be obviated, in any American port, at least, by the master calling for a survey. The proper course for a master to pursue when within reach of a court of admiralty is to apply to it for directions how to proceed, and the directions of the court will furnish him full immunity when faithfully followed.

Salvage is an important and interesting provision in maritime law. It is such compensation as may be justly due to persons by whose voluntary assistance a ship or its cargo has been saved for the owners when in great peril, or after being abandoned by the officers and crew. The right to salvage depends solely upon the question whether the property has been saved from the perils of the sea. The amount of salvage to which the salvors will be entitled depends very largely upon the extent of the risk or the perils to which the property was subjected, and the perils of making the rescue. In most of the cases reported our courts have given one half of the value of the property saved; in some instances a larger percentage, and in a few cases an award of seven-eighths has been given. Somewhat akin to salvage is the subject of contribution. It sometimes becomes necessary to lighten a ship in a storm by throwing overboard a part of the cargo. If the cargo belongs to several persons and the portion so thrown overboard belongs to one or to only a part of the owners, those whose property has been saved from impending danger by the jettison, as the throwing overboard is called, are required to contribute to the loser in what is termed general average. Demurrage is an allowance for damage by the detention of a vessel. A master is always obliged to proceed with such despatch as he can consistently with safety, and a merchant or other person who loads a vessel or receives a cargo is bound to give it reasonable despatch. It is usual in a charter-party, or verbally, to provide for the number of lay-days in which a vessel shall be loaded or discharged, and for every day in excess of the number so specified the person responsible for such delay is required by the law merchant to make proper compensation.

Consult: Benedict, ‹Admiralty Law›; Parsons, ‹Treatise on Maritime Law› (1858); Pritchard, ‹Digest of Admiralty and Maritime Law› (1887); Abbott, ‹Law of Merchant Ships and Seamen› (1903); ‹American and English Encyclopædia of Law›; article «Admiralty.» See ADMIRALTY LAW; BOTTOMRY; CHARTER-PARTY; COLLISION; FLOTSAM, JETSAM, AND LIGAN; HIGH SEAS; MARINE INSURANCE; RESPONDENTIA; SEAMEN; SHIPPING.

Law, Military, a term which applies to and includes such rules of action and conduct as are imposed by a state upon persons in its military service, with a view to the establishment and maintenance of military discipline. It is largely, but not exclusively, statutory in character, and prescribes the rights of, and imposes duties and obligations upon, the several classes of persons composing its military establishment; it creates military tribunals, endows them with appropriate jurisdiction and regulates their procedure; it also defines military offenses and by the imposition of adequate penalties, endeavors to prevent their occurrence.

Distinction Between Military and Martial Law.— It is proper to observe, at this point, that the terms ***military law*** and ***martial law***, though frequently confused, are by no means synonymous. Military law is in great part statutory in character and regulates the conduct of military persons at all times and in all places, without as well as within the territorial jurisdiction of the United States; that is, military law is applicable to certain persons, not only in time of peace, but in time of war as well, and its operation is not restricted to the territory of the United States, but follows its forces wherever they may go in the performance of lawful military duty or in the prosecution of a legitimate and duly authorized military undertaking. The Naval Articles of War, for example, do not cease to be binding upon the officers and men who constitute the crew of a vessel of war, when they pass from the territory of the United States into the high seas; indeed, by the comity of nations, those laws continue to be operative while such vessel is in the territorial waters of a foreign state. So, too, the Articles of War continue in force and have extra-territorial operation when any portion of the constitutional military forces enters foreign territory in the prosecution of a war lawfully declared by the Congress. The military laws of the United States had the same binding force in the armies of Generals Scott and Taylor while operating in Mexico that they had in respect to those portions of the army which remained within its territorial jurisdiction during that period. Military law has, also, chiefly to do with the acts and relations of military persons; it applies to the conduct of citizens in an exceedingly limited number of cases, in each of which there must be the express authority of an enactment of Congress.

Martial law, on the other hand, is not statutory in character, and arises, in every case, out of strict military necessity. Its proclamation, or establishment, is not expressly authorized by any of the provisions of the Constitution; it comes into being, as will hereafter be seen, only in the territory of an enemy in time of war, or in a part of the territory of the United States in which the proper civil authority is, for some controlling reason, unable for the time to exercise its proper functions. In the former case it is known as ***military rule*** or the ***law of military occupation*** and, as such forms a part of the Law of Nations. It disappears when such forcible resistance to the operation of the law has been overcome, or has ceased to exist, and the civil authorities have been enabled to resume the exercise of their appropriate functions.

Other Sources of Military Law.— While military law is in great part statutory, it is the function of the higher civil courts to interpret the statutes enacted by the Congress, and to apply them to cases arising in connection with their execution: and the decisions of such courts are of equal authority with the statutes upon which they are based. Among other forms of written military law may also be mentioned the decisions of the President and Secretary of War in military matters; the opinions of the Attorney General and of the Judge-Advocate General: the general regulations of the Army and the general orders of the War Department. There is also a body of well established usages known among military men as «customs of war,» which correspond, in binding force, to Customs at Common Law.

Courts-martial.— Military Law is enforced by means of certain tribunals, created for the purpose, called Courts-martial. These tribunals are created by the order of a proper convening authority, and are empowered by statute, to determine challenges, to try accusations against military persons, to reach findings of guilt or innocence respecting the same, and to impose appropriate sentences. Their sentences, however, have no legal validity, being in the nature of recommendations merely, until they have received the approval of a military commander, designated by law for this purpose, called the ***reviewing authority***. With such approval or confirmation, however, their sentences become operative and acquire the same sanction as the sentences of civil courts having criminal jurisdiction, and are entitled to the same legal consideration. Courts-martial are classified, in accordance with their jurisdiction, into ***General*** and ***Inferior Courts-martial;*** the latter term including the Regimental and Garrison Court-martial, and the Summary Court.* The General Court-martial is the highest tribunal known to military law, and has the most comprehensive jurisdiction in respect to both persons and cases. It may try any person subject to military law for any offense over which such tribunals are given statutory jurisdiction. The jurisdiction of the minor courts is restricted as to the persons and cases triable by them, and as to the punishments which they may impose upon conviction.

Courts-martial differ from civil tribunals having criminal jurisdiction, not only in the nature and extent of their jurisdiction, as will presently be seen, but in the manner of their creation. Civil courts, whether of general or special jurisdiction, are created by statutes, which define their composition, endow them with appropriate jurisdiction, and determine the times when, and the place or places where their sessions shall be held. Courts-martial, on the other hand, though authorized by statute, are created, in every case, by proper military orders, issued by commanding officers having authority, under the Articles of War, to call them into being. When the cases referred to them for trial have been completed, or, in certain contingencies, at the discretion of the appointing power, they are dissolved by the authority that created them and simply cease to exist as military tribunals.

* The several military tribunals now authorized are shown in the following table:

Those having power to try and sentence:	The General Court-martial—Complete jurisdiction.	
	The Regimental Court	Limited jurisdiction.
	The Summary Court	
	The Garrison Court	
Those having power to investigate merely:	The Court of Inquiry.	
	The Regimental Court for doing justice.	

The General Court-martial.— This court has the most extensive jurisdiction, both in respect to persons and cases, of any of the tribunals authorized by the Articles of War. It may try any military offender, whatever his rank, for any act made an offense by military law. This court may be convened at any time by the President, or by the Secretary of War acting in his behalf, by a general commanding a territorial division of an army in the field, or by a general or colonel commanding a separate territorial department. If the convening officer be the accuser or prosecutor, however, the court is convened by the President. In time of war two classes of persons are given authority to convene general courts-martial — commanders of divisions and commanders of separate brigades. This provision applies to the tactical organization of armies in the field, as distinguished from the geographical organization of military divisions and departments into which the territory of the United States and its insular possessions is habitually divided in time of peace.

Composition.—The statutes authorizing the several military tribunals known as courts-martial — contain the requirement that they shall be composed of *commissioned officers* — a term applied to persons in the military service, of and above the rank of additional second lieutenant, who have been appointed by the President, with the advice and consent of the Senate, and whose appointments are evidenced by commissions under seal, signed by the President and countersigned by the Secretary of War. The law requires that «general courts-martial may consist of any number of officers, from five to thirteen inclusive; but they shall not consist of less than thirteen when that number can be convened without manifest injury to the service.» Such judicial powers, therefore, as are vested by statute in a general court-martial become operative and may be fully exercised by a properly constituted tribunal composed of at least five members. A less number is without power to enter upon the trial of a case, to proceed with a trial already begun, or to perform any act of a judicial nature. The number of officers who shall compose a particular court is determined, in conformity to the terms of the statute, by the proper convening authority, and his conclusion in that regard is final.

The Judge-Advocate.— All courts-martial having general, as distinguished from summary jurisdiction, are provided with officers, detailed for the purpose by the proper convening authority, whose duty it is to prosecute cases coming before them in the name of the United States. The appointment of these officers is vested by statute in certain convening officers, who, as a consequence of their power to appoint courts-martial, are authorized to appoint judge-advocates for the same. The office of judge-advocate is a temporary employment created by statute; the general duties of the office are defined in the Articles of War, which empower the judge-advocate to prosecute in the name of the United States. Other statutes and regulations confer upon him the power to summon witnesses and in certain cases to compel their attendance by the issue of compulsory process. The law, regulations, and the custom of service thus vest in the judge-advocate the duty of preparing the case for trial and charge him with the responsibility of conducting the prosecution. In addition to his duty as prosecuting officer in behalf of the United States, the Articles of War provide that the judge-advocate «shall so far consider himself counsel for the prisoner as to object to any leading question to any of the witnesses, and to any question to the prisoner, the answer to which might tend to criminate himself.» The duty of the judge-advocate toward the accused should not be regarded as confined to the limited province of «counsel for the prisoner» as the same is defined in the Articles of War. Where the accused is ignorant and inexperienced and without counsel — especially where he is an enlisted man — the judge-advocate should take care that he does not suffer upon the trial from any ignorance or misconception of his legal rights, and has full opportunity to interpose such plea and make such defense as may best bring out the facts, the merits, or the extenuating circumstances of his case.

Counsel.—An officer or soldier put upon trial before a court-martial is not entitled, as of right, to have counsel present with him to assist him in his defense, but the privilege is one which is almost invariably conceded; and where it is unreasonably refused, such refusal may constitute ground for the disapproval of the proceedings. A court-martial, however, is not required to delay an unreasonable time to enable an accused to provide himself with counsel.

The Inferior Courts-martial.— The Regimental Court-martial.— The Articles of War provide that " every officer commanding a regiment or corps shall be competent to appoint, for his own regiment or corps, courts-martial, consisting of three officers, to try offenses not capital.» In addition to the commanders of regiments, properly so-called, the chiefs of such of the Staff Corps as include enlisted men in their personnel may convene these courts at posts or places occupied by troops under their direct military control and command. The strictly criminal jurisdiction of this tribunal having been transferred to the Summary Court by a recent enactment of the Congress, its functions are now largely restricted to cases which involve the redress of grievances alleged by enlisted men to have arisen in the administration of the commands to which they belong. It can now be lawfully convened for the trial of a soldier only in a case, properly referable to a Summary Court, in which the party defendant, being a non-commissioned officer, formally requests that the charges against him be passed upon by a regimental court-martial, or when such trial has been authorized by the officer competent to order the trial of the accused by a general court-martial.

The Garrison Court-martial.—While the Garrison Court-martial has the same jurisdiction in respect to offenses as the other inferior courts recognized by the Articles of War, its jurisdiction as to persons is considerably more extensive, and it may try enlisted men of any corps or arm of the service who are attached to, or form a part of, the command of the officer who has power to convene it. The regimental and garrison courts are each composed of three officers and, like the general court, are provided with judge-advocates whose duty it is to prosecute in the name of the United States: his duties have already been described. Their procedure is the same as that of the general court save that the testimony is not recorded.

The Summary Court.—This court is composed of a single officer and may be convened «by the commanding officer of each garrison, fort or other place, regiment or corps, detached battalion, or company, or other detachment of the Army.» The court may be appointed, however, and the officer who is to compose it may be designated by superior authority — that is, by the brigade, division, department, or post commander — when such a course is by him deemed either proper or desirable. The terms of the statute in respect to its constitution are thus seen to be extremely general and authorize the court to be convened by the commanding officer of a fort, camp, or other place, the garrison of which is composed of troops of the same or different corps; or by the commander of a regiment, battalion, separate company, or detachment in the field, without restriction as to its composition, for the trial of enlisted men charged with offenses falling within the jurisdiction of an inferior court in respect to the punishment which may be awarded upon conviction. When but one officer is present with a command the law requires that he shall constitute the court, and shall hear and finally determine such cases as are properly referable to it for trial.

As its name implies, the procedure of this court is summary in character. Cases are brought to trial within twenty-four hours after the arrest of the accused, or as soon thereafter as practicable, and the court sits at hours fixed by the post commander in appropriate orders or, in the absence of such orders, at the convenience of the court. The officer constituting the court is not sworn, but performs his duty under the sanction of his oath of office. The accused appears before the court and, as the right of challenge does not exist, is arraigned in the usual manner. If his plea be guilty, he is given an opportunity to make a statement and, if he so desires, to introduce testimony in respect to character. If the plea be not guilty, the trial is proceeded with in the usual manner; the witnesses are sworn, but the testimony is not recorded. The accused is given the opportunity to cross-examine the witnesses and to introduce testimony in his defense. The proceedings, finding, and sentence are approved and made operative by the signature of the reviewing authority, which is entered in the book itself, opposite the record of the trial. The commanding officers who are authorized by law to approve the sentences of Summary Courts have power to remit or mitigate the same. When the commanding officer sits as a Summary Court, no formal approval of the sentence is required by law; but he should sign the sentence, in such case in his official capacity as commanding officer, and date his signature.

Arrest and Confinement.—A military prosecution is instituted, in the case of an officer, by a military arrest. This is imposed by the proper commanding officer and requires the officer arrested to confine himself to his quarters or tent. These limits may be extended by proper authority, but a breach of close arrest is a serious offense at military law, involving the dismissal of the offender. In the case of an enlisted man the offender is placed in confinement pending his trial and, with a view to prevent abuses, it is required by law that —

> No officer or soldier put in arrest shall be continued in confinement more than eight days, or until such time as a court-martial can be assembled."

Jurisdiction of Military Tribunals.— Courts-martial have power to try military persons only for military offenses, save in time of war, when certain persons who accompany the armies in the field are similarly triable. The punishments which a general court-martial may impose include the capital penalty and are specified in the Articles of War; the power of the inferior courts to punish is restricted to three months' imprisonment, with or without forfeiture of pay, including reduction to the ranks in the case of a non-commissioned officer. The procedure of courts-martial is substantially the same as that of civil courts having criminal jurisdiction. The accused may challenge any members for cause stated, but peremptory challenges are not allowed. The court and judge-advocate are sworn and testimony is received under the usual witnesses' oath. The allegations against the accused are embodied in «charges and specifications» which correspond closely to the indictment and counts at criminal law; upon these the accused is arraigned and may plead to the jurisdiction, in bar of trial or in abatement of the action, and the court may decide any issues so arising; when these pleas have been exhausted, or if none of them be resorted to, a plea to the general issue is made, upon which the case goes to trial on its merits. The rules of evidence are those which regulate the admission of testimony in criminal cases in the courts of the United States. The judge-advocate prosecutes in behalf of the United States and, when the prosecution has rested, the witnesses for the defense are heard and the case is submitted on arguments in which the judge-advocate has the right to begin and close. The court is then closed for deliberation and a finding is reached, as to each separate charge and specification, by a majority vote. An appropriate sentence is then imposed, the majority rule prevailing, except in the case of a capital sentence where a vote of two-thirds is necessary. The record is then forwarded to the officer who convened the court whose province and duty it is to take action upon — approve or disapprove, etc.— the proceedings after the same are terminated and the record has been transmitted to him for such action. This officer is ordinarily the commander who has convened the court. In his absence, however, or where the command has been otherwise changed, his successor in command, or, «the officer commanding for the time being,» is invested with the same authority to pass upon the proceedings and order the execution of the sentence in a case of conviction.

In cases, however, of sentences of death or dismissal, imposed in time of peace, and of some death-sentences adjudged in time of war, together with all sentences «respecting general officers,» while the convening officer (or his successor) is the *original* reviewing authority, with the same power to approve or disapprove as in other cases, yet, inasmuch as the law prescribes that the sentence shall not be executed without the confirmation of the President, the latter becomes in these cases the *final* reviewing officer, and the sentence, having been approved by the officer who convened the court, the record is transmitted to him for his action. If, however, the proceedings or sentence are disapproved by the original reviewing officer, the record is not transmitted to the President, as there is nothing left in such case for the action of higher authority. Where a general court-martial is convened directly by the President as commander-in-chief, he is of course both the original and final reviewing authority. The authority of a military commander as reviewing officer is limited to taking action upon the proceedings and sentence by approving or disapproving the same, wholly or in part, and directing the execution of the sentence, and to the incidental function, of pardoning or mitigating the punishments which have been approved by him. Action not included within these powers he is not authorized to take. The power to remit or mitigate sentences awarded by military tribunals is conferred, in express terms by statute, which provides that "every officer who is authorized to order a general court-martial shall have power to pardon or mitigate any punishment adjudged by it except the punishment of death or of dismissal of an officer. Every officer commanding a regiment or garrison in which a regimental garrison or summary court-martial may be held shall have power to pardon or mitigate any punishment which such court may adjudge.

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Law of Family, The. The term family is one of extensive import and great flexibility. It may embrace an indefinite number of persons, as those who are related by blood, or who are descended from a common ancestor; or it may mean those who reside under the same roof, as members of the one household. It has no technical meaning, in law; and, as a distinct entity, apart from the members of which it is composed, a family is not the subject of legal cognizance; and, even in respect of the management of the family and the natural and domestic relation of its members to each other, there are many things which, in the interest of society, the law holds sacred, and which public policy will not permit a court of justice to inquire into.

On the contrary, there are individual rights, duties and obligations, due from the members of the family to each other, arising from the social and contractual relations between them, which the law recognizes and enforces; and the collective term, being one of constant use in the framing of statutes, contracts, wills and other written instruments, requiring judicial interpretation and construction, it has long since acquired and now possesses a distinct though not a technical meaning, in law. Hence, for the purposes of determining the personal and individual rights of its members, and in order to arrive at a proper determination of the legal effect of the term, when used in such written instruments, it has become a word of considerable legal importance. This importance, however, arises not so much from the necessity of ascertaining the rights, duties and obligations of the family as a whole as it does from the necessity of determining those duties and obligations which its members, as individuals, owe to each other or which arise from the use of the collective term to designate the members of a class of persons instead of the individuals composing that class.

In contemplation of law, therefore, a family is defined to be a collective body of persons, who form one household, existing under one head and one domestic government, including parents, children and servants, and sometimes boarders and lodgers; and, being a collective body, composed of many individuals, a family may consist of a man's household, including his wife, children or servants; or, it may be composed of his children, without a wife; or, in the absence of children, it may consist of his brothers and sisters, or next of kin, and, upon his decease may even include his heirs. Hence, it is not necessary, to constitute a family, that its head should be a father or mother, for brothers and sisters living together, without parents, may constitute a family, or, a family may consist of a widow, a widower, a bachelor, or a guardian in charge of a minor child, with their servants. In short, every collective body of persons, living together, within the same curtilege, subsisting in common, directing its attention to a common object — the promotion of its mutual interest and social happiness — and which lives with its head, as a part of the household, each member of which is dependent upon him for support, in whole, or in part, constitutes a legal family; and a separate dwelling is not necessary to complete the family, for many families may dwell under the same roof. But, since the law, in its relation to the family, operates only upon its members individually, and not upon the collective unit, as a whole, the subject is referable to the law of domestic relations, in its several branches of husband and wife, parent and child, master and servant and of boarders and lodgers, and, to those rules of construction which the courts have adopted, for the interpretation of those written instruments in which the term occurs; and, therefore, an intelligent understanding of the subject requires a consideration of each of these several branches of the law.

The relation of husband and wife, and parent and child, is based upon natural and moral law. (See Law of Husband and Wife, The.) It is the result of marriage alone; and marriage, being a "status, the result of a contract," is a civil institution, and needs none of the elements of a contract, for its support. While the relation of marriage, however, is thus primarily founded upon a contract which implies the mutual consent of the parties, when the contract is once entered into, the relation or status of marriage supersedes the contract through which it is brought about, and, when once established, it can neither be canceled, nor altered, by the voluntary consent or will of the parties, upon any new consideration, for it then becomes a civil institution or status, subject alone to the control of the public will and policy, and the rights, duties and obligations incident to the marital relation spring from, and are, thenceforth, governed by the laws of the State, and cannot be dissolved, except by the public consent, or, in the enforcement of some paramount rule of public policy, justifying a partial or absolute divorce. Being, thus, a civil institution or status, based upon natural and moral law, the relation of husband and wife and parent and child involves, in the highest degree, the natural principles of protection and dependence. From this doctrine, and from it alone, comes the rule that the husband and father is the head of the family, and, as such, has the legal right to regulate and control the household; and, in the exercise of this right, he may restrain his wife from squandering his estate, and may preserve his honor, by restraining her from keeping lewd or improper company; he has the right to the custody of his wife and children, and to the services of his wife, during coverture, and of his children, during minority, and, being the head of the family, he has the right to fix its domicil, and it is the duty of the wife and children to dwell with him there. Commensurate with these rights of husband and father, the wife is entitled to his support, affection, society and protection, and the law recognizes his natural and moral duty to maintain, protect and educate his children, and though this duty was unenforceable, by the courts, at the common law, it may now be enforced, in a proper case, under statutory provisions, generally, made for that purpose.

The husband's duty to maintain his wife, and to support and educate his children, is always in proportion to his situation and condition in life; and the duty of a father to provide for the maintenance and education of his children is independent of his obligation to provide for their mother, and is not affected by her misconduct.

Only menial or domestic servants who reside within the master's household are members of his family; and the relation, between them and the master, is purely conventional, arising alone from the contract of employment. By this contract, the servant is bound to render service to the master, in return for which he obligates himself to pay a stipulated compensation; and it is an implied condition of every contract of hiring that the servant shall yield obedience to the lawful and reasonable orders, commands and rules established by the master, for the conduct of his household. The servant is, therefore, to this extent, entirely under the control and direction of the master, and owes him respectful and decorous treatment. However, a servant is not bound to obey the master's unlawful and unreasonable orders, and, while the master has the right to use moderate correction, in the case of an apprentice, he has no right to inflict corporal punishment upon a servant, whether he be a minor or not, to enforce obedience to his commands, or for negligence or insolent behavior.

The servant being a part of the household the master is bound to provide him or her with board, and, where there is nothing, in the contract to the contrary, the servant's right to board continues, even during periods of sickness; but, in the absence of contract, the master is not bound to provide medical attendance to the servant, when taken sick in his service, nor when injured, while acting in the performance of his duties. The master owes the servant the further duty to use reasonable care to protect him from harm, while in the performance of his service, by furnishing him a safe place to work, as well as suitable instruments with which this work is to be done; and, for the master's neglect in these respects, he is liable for injuries occasioned thereby. But, whatever may be the servant's right to recover for breach of the contract of employment, the master cannot be compelled, by decree, order or judgment of court, to retain him in his employ.

A lodger is one who rests, or dwells in a place, for a time, and lodging implies a temporary habitation. The difference, therefore, between a lodger and a tenant is, that while the tenant has exclusive possession of his habitation, the lodger has merely the use of it, without actual or exclusive possession, which remains in the lessor, subject to the use. The relation between a lodger and the family of which he forms a part, is, like that of master and servant, based upon contract, and is subject to its terms; and, it is a general rule, applicable to all such contracts, that when the owner of a house takes a person to reside in a part of it, though such person is entitled to the exclusive possession of the rooms, appointed for his use, with the uncontrolled right of ingress and egress, yet, if the owner retains his character, as master of the house, the person so occupying a part of it occupies it as a lodger only, subject to the master's control. A lodger may be a boarder, but the two terms are by no means convertible because a boarder may not dwell within the family of which he forms a part.

This, in brief, is the constitution of a legal family, with a naked outline of the legal principles governing the rights and duties of its members; but, inasmuch as the general term family is one of frequent and constant recurrence, in statutes, contracts, wills and other instruments, in writing, its legal importance becomes apparent, in connection with the construction and interpretation of such documents, and, for this reason, some brief reference to this branch of the subject is necessary to its clear elucidation and understanding.

Under the homestead and exemption laws, the term family includes a household composed of parents and children, and other relatives, or domestics and servants; and since, in order to constitute a family, there must be an obligation, upon the part of its head, to support the others, or some of them, and a corresponding state of dependence, on the part of those thus entitled to support, something more is necessary, under these laws, to constitute a family, than a mere aggregation of individuals, residing within the same house; and, while some courts have held that a homestead is «one or more persons actually occupying a homestead,» others hold that a single man, or a widower having no persons living with him, other than his servants, is not the head of a family entitled to the benefits of the homestead laws. And, so, while under some exemption laws it is held that a widow, without minor children, occupying a portion of her deceased husband's house, and renting out the farm, upon which it stands, and even a deserted wife, without children, constituted a family; under others it is held that a single man does not constitute a family, although he maintains a household, and has servants and employees to care for it.

Within the purview of a statute providing for the organization of benevolent societies, to secure death-benefits to the «family or heirs» of its members, it is held that where a member was an old man, living, with a young woman, to whom he was not married, but who had lived with him in the same house for many years, and who had treated each other as father and daughter, constituted a family, under the statute, and that she was entitled to receive the benefit, upon his death. And, under statutes, subjecting the wife's property to liability for family expenses, it is held that the term «family» includes those who were living with her, as part of her household, including servants necessarily employed in the family, and constituting a part of it. So, where a statute provides an allowance, for the support of «a widow and her family» from the estate of her deceased husband, for a certain time, after his death, the term «family» is held to include, not only the widow and minor children, but also such persons as constituted the family at the time of his decease, whether servants, or children who had reached their majority; and also, a childless widow, and the children of the decedent's wife, by a former husband, if they were under age, and resided with her, are embraced within the term; but, under these laws, the term «family» does not include assistants, who may be necessary to keep the house and manage a farm, or boarders; and a boarder is not within a statute requiring or permitting service of process upon a member of the family of the person to be served. And, under a statute providing that upon the death of a man, having a family, and leaving a widow and minor child, certain property should not be deemed assets, but should be set apart for the widow, it was held that one who had not lived with his wife, for a number of years, and who, at the time of his death, was not keeping house, and had neither servants nor minor children, but had a daughter living with his wife, had a family, within the meaning of the statute.

In applying judicial rules of construction to the interpretation of contracts, where the collective term family, to designate a class of persons, instead of its members, is used, it is held that where a policy of beneficial insurance provides that, where the benefit is made payable to a class of persons, designated as the «family» or «heirs» of a member, the word «family» means next of kin, or those who would take in case of intestacy; and that the terms of a policy of fire insurance, which requires that «a family should live in the house during the whole year,» are fully complied with where two servants are left to work about the place during the absence of the assured and his family. So, a transportation ticket issued by a railroad company, for the use of «the holder and his family,» is held to enure to the benefit of an adult son living with his father as a member of the family, unless there be some restriction as to the meaning of the term, contained in the contract itself.

Upon the construction of a deed reserving, to the grantor «and his family,» an old burying-ground, with a right of way thereto, it was held that a reservation, to his family, embraced not only the grantor's children, who were members of his household when the deed was made, but also, his heirs or lineal descendants generally.

It is a well recognized principle of law that a family in its collective capacity can have no heirs, and, at common law, bequests to a family were void for uncertainty; but, inasmuch as the modern rule of interpretation is to construe the provisions of a will so as to carry out, as near as may be, the intention of the testator, the effect of this principle is now obviated, by construing the will liberally, in order to give effect to the testator's intention, and, to prevent, where possible, a forfeiture of property. (See WILL.) Thus, where a testator bequeaths property, in trust, the income of which is to be applied to his children and their «families,» the word family is held to include his sons and daughters and their children, so long as they live together and form a portion of the same household, or, from their tender years, are entitled to support, as such. So, in a will providing for a reversion of property to the testator's «family,» the term family is held to mean his widow and child, and, generally, the use of this term, in a will, is construed to include the testator's wife, as well as his children, if there be nothing in the context to show a different intention; but where the will is that of a deceased wife, the husband is not considered a member of her family, because he is neither next of kin nor heir to his wife; and, where it is the husband's will which is the subject of construction, the word family does not necessarily include a step-son, although it has been held that where a testator directs his trustees to maintain his «son, or his family,» the use of the general term includes the son's widow and her children, by him, as well as a child by a former marriage; and, a power given by will, to the testator's widow, to dispose of property for the benefit of herself and «family,» authorizes her to execute the power, in favor of an illegitimate son of one of the testator's children.

And, if a power in a will be given, for the benefit of a married woman and her family, the husband would be excluded from participation in its benefits, unless the words used be controlled or influenced by some expression showing a different intent; and, where a testator made a bequest to his son «for the support of himself and family, and for no other purpose,» it is held that the will created a trust-fund, for the use specified, and the son was not entitled to the bequest, in his own right.

In general, where in devises of real property, and in bequests of personalty, the testator uses the word family to describe a class of persons, without other limitation, it may be safely concluded that the word family, so used, will be interpreted to mean «heirs,» in respect of realty, and «next of kin» in respect of personal property, and the property, so devised or bequeathed, will, therefore, go to those who are entitled to take, as in case of intestacy, under the laws of descent and distribution.

Bibliography.— For reasons stated in the text, there is no distinctive treatise on the «law of family»; but the subject is briefly referred to in law dictionaries and encyclopedias under that title. However, for its consideration, in detail, reference must be had to works treating of the family relations generally, or of the various subjects into which it has been divided, by jurists and text writers, and to treaties upon the construction of statutes and other legal documents. As to these general and special subjects, reference is made to the following, viz.: Bouvier, ‹Law Dictionary,› tit. «Family»; ‹American and English Encyclopedia of Law,› tit. «Family»; Schouler, ‹Domestic Relations› (5th ed. 1895);

Browne, ‹Domestic Relations› (1883); Reeves, ‹Domestic Relations› (1888); Rodgers, ‹Domestic Relations› (1899); Tiffany, ‹Persons and Domestic Relations› (1896); Ewell and Mure, ‹Manual of the Law of Domestic Relations› (1896); Schouler, ‹Husband and Wife› (1882); Stewart, ‹Husband and Wife› (1884); Hochheimer, ‹Custody of Infants› (1899); Tyler, ‹Infancy and Coverture› (1882); Wood, ‹Master and Servant› (1896); Bailey, ‹Law of Master's Liability for Injuries to Servant› (1894).

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Law of Husband and Wife, The. In those communities where the system of monogamy prevails, the law of husband and wife is based upon marriage (q.v.), between one man and one woman, and is to be found in the provision made, by the law-making power, for the regulation and enforcement of the rights, duties and obligations arising from the relation thus established between them. And, in those jurisdictions in which the principles of Anglo-Saxon jurisprudence maintain, the law of husband and wife is embodied in the doctrines of the common law of England, as modified by the application of the principles of equity to the property rights of the wife, and by statutory charges affecting, in this and in other respects, the personal rights and duties of either the husband or the wife.

In its legal aspect, marriage is a status, the result of a contract; but, when the relation of marriage is once entered into, the contract, through which it is brought about, ceases to exist, and thenceforth the relation of husband and wife is governed alone by the laws of the State in which it exists, and it cannot afterward be modified or changed by the voluntary consent of the parties, nor can it be dissolved upon any new consideration, in so far as they are concerned. This can only be done by some action upon the part of the State, for reasons which may be considered sufficient to meet the demands of an enlightened public policy, or which may conserve the general welfare of the State.

The institution of marriage «has its foundation in nature,» and is said to be «the parent and not the child of civil society»;* and, being based upon natural law, involves, in the highest degree, principles of dependence and protection.

It was a principle of the common law that, upon marriage, the husband and wife became one person, inasmuch as the legal existence of the wife was absorbed or merged into that of the husband; and, while the legal identity of the husband was, in no wise, affected by the marriage, that of the wife was wholly suspended during coverture; and, under this principle, the husband's dominion over the person and property of the wife became paramount during the continuance of the marital relation between them. For this reason, the wife was wholly incapable of entering into any contract, or of acquiring, conveying or encumbering real estate, in her own right, or of disposing of personal property, by gift or otherwise, without the husband's consent; nor could she sue or be sued alone. Indeed, she was rendered wholly incapable of doing any act *sui juris*, though she might act in any capacity which did not involve a question of her own status, and which was not inconsistent with her legal disabilities as a married woman. She was, therefore, enabled to act as the agent or trustee of another; but, being wholly incapable of entering into contracts in her own behalf, she had no power to appoint an agent to act for herself — not even her husband — and, when acting as trustee, the husband's consent and concurrence was necessary, because he was personally responsible for any breach which might have been committed in the execution of the trust of which she was the trustee.

To the legal disabilities of the wife, however, there were certain exceptions; and, even at the common law she had the right to act, as a feme sole, in case of necessity, or when she was absolved from the disabilities of coverture, by certain local customs. Thus, the wife had the right to act, as an unmarried woman, where the husband was an alien, or where he had been banished or transported for life, or, where he had abjured the realm, or, where he had been imprisoned as a felon; and, by the well-known custom of London, she was enabled to transact business, in her own name, in which her «husband meddleth nothing,» and she was chargeable, under this custom, «as a feme sole, concerning anything that toucheth her craft.»

Growing out of, and incidental to the marital relation, the common law imposed certain duties and conferred certain rights upon the husband and wife, the performance and enjoyment of which could not be avoided, unless under exceptional circumstances. Among these duties, the husband was bound to support and protect the wife, though there was no reciprocal duty upon the part of the wife to support the husband, except to the extent of her services; she was bound to «honor, love and obey» him, and allow him matrimonial intercourse and cohabitation, and both were entitled to the society and protection of the other; the husband, being the head of the wife, was entitled to the custody of her person, and the control of her property and services; he had the right to fix the marital domicil, and it was her duty to dwell with him there.

Collateral to the doctrine of the merger of the legal existence of the wife into that of the husband, all ante-nuptial contracts, between the husband and wife, were rendered void by the marriage, and, during coverture, they were incapable of entering into any contract with each other; and, upon the same ground, neither the husband nor the wife were liable for torts committed, by the one, against the other. However, the wife's ante-nuptial contracts and torts, with, and against third persons, were in no wise affected by the marriage, the husband being liable for their payment and satisfaction, even though he obtained no property from her, by the marriage; and, if he died, or, for any other reason, the coverture ceased, the obligation and liability of the wife for her ante-nuptial contracts and torts, in favor of third persons, were not extinguished, but were still enforceable against her, upon the termination of the marriage. Upon the other hand, for torts committed against the wife, by third persons, other than the husband, a right of action arose in her favor, although an action could not be maintained by her for their enforcement, without joining the husband in the suit; and damages, if any, recovered, collected and reduced to possession, by the husband during coverture, became the property of the husband, by virtue of his marital rights, and were subject to the payment of his debts, and went to his personal representative, upon his death.

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* This natural origin of marriage is generally recognized by the jurists of England and America; but the doctrine is by no means of universal application. For, when the revision of the laws of France was under discussion, by the Council of State, under the first Napoleon, that reformer is credited with having expressed the opinion, that, "*Le mariage ne dérive point de la nature. La famille orientale diffère entirement de la famille occidentale. L'homme est le ministre de la nature, et la société vient s'entrer sur elle. Les lois sont faites pour les mœurs et les mœurs varient.*" Upon another occasion, the same authority is said to have maintained, that, "*Si l'homme ne vieillissait pas, je ne lui voudrais pas de femme.*"

Upon the common law doctrine that the husband was entitled to the ***consortium*** of the wife, he was entitled to maintain an action, against third persons, for the recovery of damages, for any act which interfered with this right, and, therefore, an action arose in his favor for the alienation of his wife's affections, even though the wrongdoers were the parents of the wife, although an action for the same cause was denied to the wife; the reason assigned for this denial being that the wife was incapable of maintaining an action for the enforcement of the right, without joining the husband, as a party plaintiff, and since any judgment, in an action for tort in her favor would have enured to his individual benefit, it was considered to be against public policy to allow the recovery of damages, in his own favor, for an injury which he himself had caused; but, since this objection applied only to the remedy, and not to the right, the principle upon which the action was based was held to apply to the wife as well as to the husband; and this being recognized, the right of action continued in the wife but was held in abeyance until the disabilities of marriage were removed by death, or otherwise, when it was enforceable by her, as a feme sole. Ordinarily, neither the husband nor the wife could be held liable for crime committed by the one against the other; but, to this rule there were certain exceptions, such as assault, manslaughter, and other crimes of an aggravated character, where the interest of the public, requiring the punishment of criminals overbalanced the mere private interests of the individuals, incident to the marital relation.

The liability of the husband or the wife for crimes, committed by either of them, against third persons, was in no wise affected by the marital relation, though, if the crime, complained of, were committed by the wife, in the presence of the husband, the ***prima facie*** presumption was that she acted under his coercion, and, in such case, the husband was liable, and not the wife. This presumption, however, was subject to rebuttal, and where it was overcome, by the circumstances attending the commission of the crime, she was liable, and not the husband.

The husband's natural duty to support the wife, as recognized at the common law, required him to supply her with all the necessaries requisite and suitable for her maintenance, commensurate with his social position and condition in life; and this duty necessarily extended to supplies furnished to her, for her children's support, as well as for her own. If the husband failed to perform his duty in this respect, the wife was entitled to use his credit to obtain such necessaries and supplies; and for this purpose, her authority to bind the husband was complete, and, being based upon a duty incident to the marital relation, and not upon contract, this authority existed, in favor of the wife, independent of the doctrine of agency, to which it has been generally ascribed.

The full performance of the husband's duty to support the wife was only excused by an abandonment upon her part, without cause; or, as the result of a divorce *a vinculo,* or, where there was a separation by mutual consent, upon a stipulation that he would make a suitable allowance for her support, which is regularly paid by him; and the husband was not relieved from the performance of this duty in case he turned the wife out of doors, or deserted her without cause, and failed to supply her with the means of support.

In consideration of the liability of the husband for the wife's ante-nuptial debts and torts, and of his duty to support her, according to his social position and condition in life, the common law vested in him, *jure mariti,* the ownership, enjoyment and control of her entire estate, real and personal, subject only to certain limitations growing out of the nature of the property which she owned, and its condition, at the date of the marriage. Under the operation of this doctrine, the husband became the absolute owner of all the personal property of the wife, in possession, whether acquired before or after marriage; and no act, upon her part, was necessary to vest the title to such personal property in him. He was also entitled to her choses in action, subject only to the condition, that in order to vest the title in him, they were required to be reduced to the husband's possession, during coverture, and this he was entitled to, without her consent; but the mere custody of a chose in action was not, in itself, such a reduction to possession, as to entitle him to its ownership; hence, in order to reduce the wife's choses in action to possession, some affirmative act, upon his part, was necessary to show an intention to acquire title in himself. If the husband failed to reduce the wife's choses in action to possession, however, during coverture, her title to such property continued unimpaired; he was entitled to the income therefrom, but her ownership and right of possession continued, and survived the coverture, and, upon the dissolution of the marital relation, she was entitled to its enjoyment, as though she had never been married. The husband's right to the real estate of the wife extended only to its use, and the enjoyment of its rents, issues and profits, during the marriage. Hence, he had no right, without her consent, to encumber her real estate, nor to change her realty into personalty, or to do any other act, the effect of which was to change the course of descent, or the right of succession to her heirs.

Besides these rights and interests of the husband in the wife's property, he was also entitled to curtesy in her real estate, which became vested in him, upon her death, provided always, that issue was born of the marriage, and, as an offset to the husband's right of curtesy, the wife was entitled to dower in his real estate, regardless of whether issue was born of the marriage or not. This right of dower, it may be observed, was the only interest which the wife acquired in the husband's property, real or personal, by virtue of the marital relation; her right to any part of his personal property, whether before or after his demise, being entirely a matter of statutory enactment.*

The wife's property thus acquired, by the husband, in virtue of the marital relation, became the absolute property of the husband; he could alienate and dispose of it, and it became subject to the payment of his debts, as any other property, belonging to him.

While the natural rights and duties of the husband and wife, growing out of the marital relation, have always been respected and upheld in equity, courts of chancery, in England and America, have never recognized nor adopted the principles of the common law, respecting her property; and, in recent years, these principles have been materially changed, by statute, in both countries; and the tendency of modern legislation is to wholly emancipate the wife's property from the husband's ownership and control, and in this respect, at least, to treat her as a feme sole.

Thus, the common law rule, that ante-nuptial contracts between husband and wife were avoided by marriage, was so far modified in equity as to uphold and enforce settlements made, by the husband, for the benefit of the wife, where such settlements were made in consideration of the marriage; and, the same is true of provisions made by him, either before or after marriage, for the personal comfort and adornment of the wife, in the nature of *pin-money* and *paraphernalia,* or, where gifts of property were made, by third persons, for the separate use of the wife; and, courts of equity, in recognition of the wife's right to the acquisition and enjoyment of property in her own right, have even gone so far as to uphold gifts of real estate made, by the husband to the wife, through the intervention of a third person. Courts of chancery have also recognized and enforced the wife's equity to a settlement in property which she owned, at the date of the marriage, where it was necessary for the husband, or his creditors or assignees, to invoke the aid of these courts, to reduce it to possession; or, where the husband married a ward of the court, without its consent; the maxim in the one case being that he who seeks equity must do equity, while in the other the settlement was compelled, as a punishment to the husband, for his contempt of court, in marrying a ward without the chancellor's consent.

The wife's equitable right to a settlement was the same, whether the property in question were legal or equitable in its nature. This equity to a settlement was, however, a personal right, which the wife alone could enforce, and being an allowance, made out of her own property, for her benefit and for the benefit of her children, might be waived by her, or entirely defeated, if she had a suitable provision otherwise made for her and their support; and the wife's right to a settlement was likewise barred by her fraud or misconduct.

This equitable right of the wife was enforceable, by actions brought and maintained directly in her own behalf, or, in actions brought by creditors or assignees of the husband in order to subject her property to the payment of his debts, or the acquirement of its possession, under an assignment from him. Although these rights of a married woman were fully recognized and enforced in equity, still she had no right to maintain or defend an action, in her own name, for their enforcement, the rule requiring that the husband should be joined, with her, in the suit, or, if his interests were adverse to hers, she came or was brought into court, as complainant or defendant, by or in the name of a next friend.

Aside from these equitable principles recognizing, and to this extent, enforcing the property rights of married women, the common law doctrine of the merger of the legal existence of the wife into that of the husband, and her right to hold and enjoy property, in her own right, has been materially modified, and in some jurisdictions entirely abrogated, by statute, and a married woman now stands, in respect of her separate property, generally, as though she were a feme sole; and, where, by statute, she is enabled to hold property in her own right, she may make any contract concerning its management and disposition, as though she had never been married. In some jurisdictions also the husband is wholly released from his common law liability to answer for the ante-nuptial contracts and debts of the wife, while in others, this liability is restricted to the value of the property which he acquires through the marriage, and generally he is released from all responsibility for her post-nuptial torts, unless committed, by his authority, direction or encouragement. So, the common law disability of the wife to acquire property has been generally removed by statute, and she may now acquire property, real or personal, by gift, bequest or devise, directly from the husband, or, from third persons; and, having the authority to acquire and hold such property, she has the right to convey it, without the husband's

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(*) Under the civil law, the natural duties and obligations of the husband and wife are much the same, as they were at the common law; the husband is bound to protect and support the wife, according to his means and condition in life, while the wife owes the husband obedience; and, without his consent, she is incapable of acting in law. If, however, she engaged in business, as a sole trader she could bind herself, in any thing relating to her trade, without his consent. As regards property, however, the principles of the two systems, are, in many respects, different. Under the civil law, the wife's property is divided into dotal, or that which the wife brings to the husband, upon marriage, to assist in maintaining the common ménage, and extra-dotal, or that which forms no part of her dowry; and, extra-dotal property includes partnership or community property, *e. i.* such property as is acquired during the coverture, by the joint efforts and labors of both. In the wife's dotal property the husband has no interest except the enjoyment of its usufruct, while in the extra-dotal, or community property, both have a joint interest during life, the undivided moiety of which goes to the survivor, upon the death of either. Both the husband and the wife are enabled, under the civil law, to enter into contract respecting their separate property, in any way, not incompatible with good morals, or which is not in derogation of the husband's authority over the wife and his children, or which does not change the legal order of succession. *Vide* Kent's Comm., Vol. II., pp. 183-187, and notes.

consent, and, his joinder in conveyances of real estate, is only necessary to bar his right of curtesy, for the same reason that the wife was always required to join in the husband's deed in order to avoid her claim to dower in his lands.

When the wife is empowered, by statute, to acquire, hold and dispose of property, in her own right, she may enter into contracts for its management, protection and improvement, and for the enforcement of such contracts, she may sue and be sued as a feme sole; and the right of the wife to maintain actions, in her own name, is not necessarily restricted to actions respecting her separate property, but this right is now extended by statute, in many States, so as to include the maintenance of actions for personal wrongs and other injuries; and for these she may maintain actions, in her own name against the husband, as well as against others, without joining the husband, or suing in the name of a next friend.

The statutory emancipation of the wife, and her property, from the management and control of the husband, however, is not necessarily in all cases complete, and, being in derogation of the common law, the statute under which the right, whatever it be, is claimed, is to be construed strictly, and the right will not be upheld, unless expressly granted, or unless it arises, by necessary implication, from the terms of the statute under which it is sought to be enforced.

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Law of Nations. See INTERNATIONAL LAW.

Law, Patent. See PATENTS, THE LAWS OF.

Law, Physical. See PHYSICS.

Law Schools. The first American law school was founded at Litchfield, Conn., in 1784 and discontinued in 1833. Though not connected with any university it seems to have made an excellent record. Of 1,023 graduates, 50 became members of congress, 15 United States senators, 40 judges of the higher State courts, 10 governors of States, 5 cabinet officers, 2 justices of the Federal Supreme Court, 1 vice-president of the United States and several foreign ministers. A course of lectures in law was delivered in the College of Philadelphia in 1791 by James Wilson, who had been appointed professor of law in that institution, but his work was discontinued before the close of the second course. In 1797 James Kent made a similar attempt at Columbia, but he gave only one course of lectures. The Harvard Law School, established in 1817, was the earliest school in the country connected with a university and authorized to confer degrees in law. The course was lengthened to three years in 1877. There were no examinations for the degree till 1871, and none for admission till 1877. At the beginning of the year 1897 the rule came into force by which only graduates of approved colleges and persons qualified to enter the senior class of Harvard College are admitted as regular students. The Yale Law School was established in 1824, that of the University of Virginia in 1825, and the Cincinnati Law School in 1833. Law schools had exercised little influence on the legal profession in this country up to the time of the opening of the Columbia Law School in 1858. In 1878 there were 50 schools with 3,012 students; in 1901 there were 86 schools with 11,883 students. The increase in students in 23 years has been 294 per cent. See also EDUCATION, PROFESSIONAL, IN AMERICA.

Lawes, lâz, **Henry**, English composer: b. Dinton, Warwickshire, 1596; d. London 21 Oct. 1662. He was a brother of William Lawes (q.v.) and was educated as a classical musician. He became famous as a composer for masques and songs and he is eulogized by Milton in several poems. He set to music the poet's ‹Masque of Comus› and supervised its production at Ludlow Castle in 1634. He published: ‹Ayres and Dialogues, for One, Two and Three Voices› (1653).

Lawes, SIR **John Bennett**, English chemist: b. Rothamsted, Hertfordshire, 28 Dec. 1814; d. there 31 Aug. 1900. He was educated at Eton and at Oxford, whence he went to London, and there remained for a while engaged in the practical study of chemistry. Reaching his majority, he came into possession of his estate, where he undertook experiments in agricultural chemistry in the interest of a more scientific method of agriculture. In 1843 he employed Dr. (afterward Sir) J. H. Gilbert as superintendent of laboratory work at the Rothamsted farm, and uniting his own labors with those of his colleague, by a course of investigations, indoors and out, developed scientific processes whereby superphosphate of lime came to be used as a fertilizer. For over 50 years they carried on these labors together, and important practical results for improved agriculture are recorded to their credit. In 1899 Lawes transferred his laboratories and experimental fields, with an endowment amounting to about £100,000, to a board of trustees, in order to secure their permanent usefulness. Accounts of the Rothamsted experiments may be found in the ‹Journal› of the Royal Agricultural Society of England; ‹Reports› of the British Association for the Advancement of Science, ‹Proceedings› and ‹Transactions› of the Royal Society of London, ‹Journal› of the Horticultural Society of London,› and ‹Memoranda› of the Rothamsted station.

Lawes, William, English composer: d. Chester, England, 1645. He was an elder brother of Henry Lawes (q.v.), with whom he was associated in various musical matters, and not only wrote music for many of the songs of the time, but the music for Sandys' version of the Psalms, published in 1648.

Law'less, Emily, Irish novelist, daughter of the 3d Baron Cloncurry: 1845. She has published several popular romances of Irish life, full of pathos and picturesqueness, among which are: ‹A Millionaire's Cousin,› ‹Hurrish: a Study› (1886); ‹Grania,› her most powerful work (1892); and ‹Maelcho,› a story of the rebellion of Sir James Fitzmaurice in the 16th century (1894). She is also the author of ‹Ireland,› in the ‹Story of the Nations› series (1890); ‹A Garden Diary› (1901); ‹With the Wild Geese,› poems (1902).

Law'ley, Alethea Jane Wiel, English historical writer, 2d daughter of the 2d Baron Wenlock. She was married to Cavaliere Tatteo Wiel in 1890 and lives in Italy. She has published ‹Vittoria Colonna,› a study (1888); ‹Venice,› ‹Story of the Nations› series (1894); ‹The Romance of the House of Savoy› (1898); ‹Verona,› in ‹Mediæval Towns› series (1902); etc.

Lawn, finely woven white goods, cotton or linen, of an open texture; plain or printed. The white sleeves, which form a part of the dress of a bishop in the English Church, are made of lawn.

Lawn-tennis, a modern game, played on grass, gravel, cinder, or asphalt courts, with balls and rackets. The face of the racket is now invariably plane, and consists of a net formed of tightly-strung gut. The balls are of rubber covered with white flannel, about 2½ inches in diameter, and 2 ounces in weight. For a game between two players (a single-handed game) the court is 78 feet long by 27 wide. It is divided across the middle by a net, the ends of which are attached to two posts, which stand three feet outside the court on each side. The height of the net is 3½ feet at the posts and 3 feet at the centre. At each end of the court, parallel to the net and 39 feet from it, are drawn the base-lines, the extremities of which are connected by the side-lines. Half-way between the side-lines, and parallel to them, is drawn the half-court line, dividing the space on either side of the net into two equal parts called the right and left courts. On either side of the net, at a distance of 21 feet from it, and parallel to it, are drawn the service-lines. The players take up their positions on opposite sides of the net, and one of them, decided by tossing, called the server, standing with one foot behind and one foot on the base-line, serves the ball from his right court into the diagonally opposite court. The ball is served by being struck with the face of the racket while it is in the air, and the stroke is counted a fault if the service be from the wrong court, or if the server do not stand as directed, or if the ball do not strike the ground in the diagonally opposite court within the service-line. After a fault, the server must serve again from the same court, unless the stroke was a fault because served from the wrong court. The next service comes from the left court, and thereafter the courts are taken alternately. The non-server is called the striker-out, and it is his business to return the ball by striking it with the face of his racket. The server wins a stroke if the striker-out «volley the service,» that is, strike the ball before it touches the ground, or fail to return the service or the ball in-play, or return the service or the ball in-play so that it drop outside any of the lines which bound his opponent's court, or otherwise lose a stroke in accordance with the recognized laws of the game. The striker-out wins a stroke if the server serve two consecutive faults, or fail to return the ball in-play, or return the ball in-play so that it drop outside any of the lines which bound his opponent's court, or otherwise lose a stroke. On either player winning his first stroke the score is called 15 for that player; on either player winning his second stroke the score is called 30 for him; on either winning his third stroke his score is called 40; and the fourth stroke won by either player is scored game for that player. However, if both players have won three strokes, the score is called deuce; and the next stroke won by either player is scored advantage for that player. If the same player win the following stroke, he wins the game; but if he lose the next stroke, the score is again called deuce; and so on until one player win two strokes immediately following the score at deuce. The player who first wins six games wins a set, but with both at five a method of scoring similar to advantage is often introduced. Sides are changed at the end of every set. Three-handed and four-handed lawn-tennis differ in no essentials from the game as above described. The game of lawn-tennis as now known was introduced about 1875.

Lawns: Their Preparation and Care, a closely-mown turf maintained for ornament in parks and private grounds. It may or may not be dotted with trees, shrubs, or other specimen plants, or even with flower beds. These are, however, mere incidents, and since they usually detract from the natural beauties of an open sward, should usually be confined to the borders in irregular, rather than formal, order. The lawn thus becomes the canvas and the side-planting the frame for a natural picture in which the dwelling or other prominent feature is placed.

Whether the contour of the surface be level, convex, or concave, it should always be graded so as to avoid even slight irregularities, and where the land is rolling all three contours should be harmoniously blended so as to avoid breaks such as terraces, and so as to ensure the repose that comes from such blending. Except on sand and clay, lawns do well on practically all soils if properly prepared and maintained. After the grading, the land should be plowed, dug, or forked, as deeply as the soil will permit, even to the depth of two feet, then harrowed thoroughly, removing all stones and burning all rubbish, weeds, etc. A liberal dressing of complete fertilizer containing potash, phosphoric acid and nitrogen in readily available forms should be given, and where possible a covering of an inch or more of rich soil is often of decided advantage. Except for their containing seeds of weeds, animal manures are especially valuable, that of sheep and cattle being usually better than ordinary stable-manure; when the latter is applied it should always be after thorough composting and rotting to destroy weed-seeds. The surface being very smooth, the fertilizer well harrowed in and the wind asleep, seeding may be performed, preferably just before rain. The seed should be the purest that can be obtained, and may or may not be raked in, but the land should always be heavily rolled. In the Northern States the popular grasses for lawns are Kentucky bluegrass, which is especially valuable for soils rich in lime, red-top and Rhode Island bent-grass. (See GRASSES.) Mixtures of several grasses are valuable because the grasses that start first choke out weeds and are later themselves choked out by the slower-growing blue-grass.

When the grass is three inches tall it should be cut with a scythe, and afterward with a lawnmower as occasion may require. In the autumn a dressing of well-composted manure should be given, and in the spring the strawy useless parts should be raked off before growth starts. After the frost is out of the ground the lawn should be rolled to compact the turf, which usually heaves more or less during the winter. It is further essential that weeding be performed every year, but especially during the first, second and third. If desired, a sprinkling of white clover (*Trifolium repens*) may be given by sowing the seed after or before the grass seed; being of different weights, they cannot be sown together. White clover may also be sown upon heavy and poor soils, where it will often make a good stand and a good precursor for grass. In the South, the grasses mentioned usually fail, and should be replaced by species that can withstand the climatic conditions. The most satisfactory and popular are Bermuda grass, joint grass, and St. Augustine grass. The first is usually propagated by passing the roots, freed from soil, through a feed cutter, sowing and harrowing the pieces.

Small lawns are frequently made by transplanting sod from old pastures, in which cases the turf is cut in long strips about 15 inches wide, rolled up and laid down like carpet, and then pounded or heavily rolled to press the roots firmly against the soil. The subsequent management should be that given seed-sown lawns. Owing to the dryness of the summers in many parts of the United States, lawns are often considered failures. Too frequently, however, these results follow imperfect preparation and improper management. As a rule lawns should not be watered while they are young or in the early part of the season, because this tends to keep the roots near the surface and to make the grasses less able to withstand dry weather. Water should therefore be withheld until the plants seem to be in dire need, and then it should be applied in what may seem excessive quantities.

M. G. KAINS,
Crop Expert.

Lawrence, lâr'ĕns, **Abbott,** American manufacturer and diplomatist: b. Groton, Mass., 16 Dec. 1792; d. Boston 18 Aug. 1855. In 1814 he became one of the firm of A. and A. Lawrence, which for many years conducted a prosperous business in the sale of foreign cotton and woolen goods on commission, and later established a cotton industry in Lowell, Mass., with his brother Amos (q.v.). He was a member of the 24th Congress, and again 1839-40. He was a commissioner in 1842 to settle the Northeastern Boundary question and arranged a basis for settlement with Lord Ashburton which was satisfactory to both the United States and England, and was minister to Great Britain in 1849-52; founded the Lawrence Scientific School of Harvard University, to which he gave $100,000.

Lawrence, Amos, American merchant: b. Groton, Mass., 1786; d. Boston 31 Dec. 1852. He was educated in his birthplace at an academy founded by his father. He worked for many years as a clerk and in 1807 started at Boston a dry-goods business of his own, formed a partnership with his brother (1814), and began a large wholesale business. Lawrence and Lowell became the centres of this firm's manufacturing activity which soon placed them at the head of the cotton-spinning and weaving trade. Amos Lawrence retired from active business in 1831 through ill health, and spent much of his later years in promoting works of philanthropy and patriotism. The academy at Groton, of which he was a liberal benefactor, was named Lawrence Academy in his honor (1843); he contributed liberally to the raising of the Bunker Hill monument, and made large contributions to Williams College. Consult ‘Extracts from the Diary and Correspondence of Amos Lawrence with a Brief Account of Some Incidents in His Life’ (1855).

Lawrence, George Alfred, English novelist: b. Braxted, Essex, 25 March 1827; d. Edinburgh, Scotland, 23 Sept. 1876. He was educated at Oxford, studied law, but soon turned his attention to fiction and became suddenly famous by his novel ‘Guy Livingstone, or Thorough’ (1857). He was much read in America as well as in his own country, and ‘Sword and Gown’ (1859); ‘Breaking a Butterfly’ (1869); and his other fiction increased his popularity for the time, though he is now little read.

Lawrence, George Newbold, American ornithologist: b. New York 20 Oct. 1806. He was privately educated, was for some years in the drug business, but in 1867 retired, and thereafter devoted himself to ornithology. From 1846 he contributed to the literature of ornithology; and he also made an extensive and valuable collection of birds, including 8,000 specimens representing almost every variety found in the United States, and an excellent series of the birds of Mexico, Central America, the West Indies, and South America. This collection he sold to the American Museum of Natural History. He assisted Baird and Cassin in the preparation of ‘The Birds of North America’ (1860).

Lawrence, James, American naval officer: b. Burlington, N. J., 1 Oct. 1781; d. 5 June 1813. He entered the navy as a midshipman 4 Sept. 1798; in 1800 was made acting lieutenant, and in April, 1802, lieutenant, and served during the war with Tripoli; he was first lieutenant of the schooner Enterprise, and one of the party which boarded and destroyed the frigate Philadelphia in the harbor of Tripoli on the night of 15 Feb. 1804. Shortly before peace was concluded he was given command of a gunboat, and on his return to the United States, served as first lieutenant of the Chesapeake, and subsequently commanded the Vixen, the Wasp, and the Argus. In November 1810 he was promoted to the rank of master commandant, and given command of the Hornet. In 1812 he cruised in the Hornet with Commodore Bainbridge's squadron along the South American coast and at the mouth of the Demara River he met the British brig Peacock, which after a severe action of about 15 minutes he forced to surrender. When she surrendered, the Peacock was badly damaged and sinking, and Lawrence transferred the crew to his own ship. (See HORNET.) On 14 March 1813 he was promoted to the rank of captain and appointed to the frigate Chesapeake, then lying in Boston; the Hornet was also placed under his orders, and it was intended that the two ships should sail against the Greenland whale fishery. On 1 June 1813, when the Chesapeake was ready for sea, Lawrence sailed out of the harbor to meet the British ship Shannon; after a severe battle he was forced to surrender, and his ship was taken as a prize into Halifax. (See CHESAPEAKE AND SHANNON, BATTLE OF.) Lawrence was fatally wounded and died four days after the battle; throughout the action he showed the greatest coolness and courage, and his last words as he was carried from the deck were, «Don't give up the ship.»

Lawrence, John, American statesman and judge: b. Cornwall, England, 1750; d. New York 1810. He emigrated to America in 1767, settled in New York, was admitted to the bar in 1772, and soon established himself in successful practice. An active patriot at the outbreak of the Revolution, he served in the army throughout the war, and on the termination of hostilities returned to New York, where for many years he was engaged in a large and lucrative professional practice. He was a member of the State senate, when in 1789 he was elected the first representative from New York city in the first United States Congress. He was a zealous and able defender of the measures of Washington, and on measures relating to the public credit and the national currency, to the neutrality of the United States as regards European belligerents, to indiscriminative foreign commerce, and to the promotion and security of all our commercial interests, spoke with eminent comprehensiveness and foresight. He represented the city of New York in the second Congress, and in 1794 was appointed by President Washington judge of the United States court for the New York district. He accepted this office at the particular solicitation of the bar, in consequence of his knowledge of admiralty law and the increasing number of admiralty cases. He resigned it in 1796 upon being elected to the United States Senate, of which body he was for a time president. He supported the measures of President Adams, upon whose retirement he resigned his seat and withdrew to private life.

Lawrence, SIR **Thomas,** English portrait-painter: b. Bristol 4 May 1769; d. 7 Jan. 1830. His father was an innkeeper, and the artist very early exhibited proofs of his talent for the art; he is said to have sketched portraits very successfully in his fifth year. At the age of six he was sent to school, where he remained two years; and this, with the exception of a few lessons subsequently in Latin and French, constituted his whole education. Young Lawrence, however, had access to the galleries of some of the neighboring gentry, in which he employed himself in copying historical and other pieces, and at the age of ten he had full employment as a painter of portraits in crayons. In 1787 the family removed to London, and Lawrence was admitted a student at the Royal Academy. His subsequent career was successful and brilliant. He was elected in 1791 a Supplemental Associate by the desire of the king, being under the age (24) fixed by the laws of the institution. No other case of the kind has occurred. On the death of Sir J. Reynolds the next year he was made painter to the king. His reputation grew steadily, and he was soon considered the first portrait-painter of the age in England. His scene from the 'Tempest' was a successful attempt at historical painting. In 1794 he was made a Royal Academician. In 1815 he was knighted by the Prince Regent, who also employed him to take the likenesses of the allied sovereigns and the most distinguished persons of their suite. During their visit to England he finished the portrait of the King of Prussia, and went to Aix-la-Chapelle several years afterward to paint the Emperor Alexander; thence he went to Vienna, where he completed the portraits of the emperor, the archdukes, Metternich, etc., and in Rome painted Pius VII. and Cardinal Gonsalvi. These portraits are now in the Waterloo Gallery at Windsor, and are of great historical value. On his return to England he was elected president of the Royal Academy, as successor to West. This office he held till his death. His portraits are striking likenesses, and display a bold and free pencil; but they are, particularly his later ones, chargeable with mannerism, and are not considered to be successful in expressing the nicer shades of character. His income for the last 20 years of his life was very large, but he died poor, owing to the lavishness with which he spent money in acquiring the first-rate productions of his art, in assisting less fortunate artists, and in other ways. His valuable and unrivaled collection of drawings by the old masters was unfortunately dispersed after his death.

Lawrence, SIR **William,** an eminent surgeon and anatomist: b. Cirencester 16 July 1783; d. 5 July 1867. He received his early education at a private school, and in 1799 was apprenticed to the celebrated Abernethy, and was an inmate of his house for five years. In the third year of his apprenticeship he had given such proofs of his zeal and capacity that Abernethy appointed him demonstrator in anatomy at Saint Bartholomew's, and for 12 years he discharged the duties of his office with signal ability. In 1824 he became principal surgeon to Saint Bartholomew's Hospital, the office of surgeon to which he had filled from 1813. Within two years from this date he had discharged successively the duties of surgeon to the Eye Infirmary in Moorfields, and surgeon to the Royal Hospitals of Bridewell and Bethlehem. In 1816 he published an 'Introduction to Comparative Anatomy and Physiology,' and in 1819, 'Lectures on the Physiology, Zoology, and Natural History of Man,' which provoked the hostile criticism of theologians. In 1829 he succeeded Abernethy as lecturer on surgery to Saint Bartholomew's, and altogether he was connected with this hospital 65 years. Shortly before his death he was made a baronet. Few men of his time did more than he for the advancement of surgery. His treatise on 'Hernia' was a standard work, and that on 'Diseases of the Eye' (1833) marks an epoch in ophthalmic surgery. His lectures on surgery were published in 1863. He was twice president of the Royal College of Surgeons, and on two occasions he delivered the Hunterian oration.

Lawrence, William, American politician: b. Mount Pleasant, Ohio, 29 June 1819; d. 8 May 1899. He was graduated at Franklin College (1838) and at the Cincinnati Law School (1840). He early became prominent in politics, and from 1845 to 1847 owned and conducted the 'Logan County Gazette,' and was afterward editor of the 'Western Law Journal.' He served in the lower house of the State legislature, and for five years as State senator, and from 1857 to 1864 was judge of the court of common pleas, and of the district court. After seeing some military service (1862), he was elected to Congress in 1865, and in 1880 appointed first Comptroller of the United States Treasury, from which office he retired in 1885. He has published several books on law, notably, 'The Law of Claims against the Government' (1875); and 'The Treaty Question' (1871).

Lawrence, William, American Protestant Episcopal bishop: b. Boston 30 May 1850. He was graduated at Harvard in 1871, and at the Episcopal Theological School, Cambridge, Mass., in 1875; was rector of Grace Church, Lawrence, Mass., 1876–84; professor of homiletics and pastoral theology at the Theological School above named, 1884–93; dean of the school, 1888–93. He was university preacher at Harvard, 1888–91. In October 1893 he was elected bishop of Massachusetts, to succeed Bishop Brooks, and was consecrated to that office, which he continues to hold, in the following year. He has published a 'Life of Amos A. Lawrence,' his father (1889); 'Visions and Service' (1896); 'Life of Roger Wolcott,' and other works.

Laurence, William Beach, American jurist: b. New York 23 Oct. 1800; d. there 26 March 1881. He was graduated at Columbia College in 1818, and after his admission to the bar in 1823 he practised in New York, where he attained eminence. He removed to Newport, R. I., in 1850; was elected lieutenant-governor of Rhode Island in 1851, and soon after became acting governor. He became widely known by reason of his connection with the «Circassian case» in 1873, before the American and British International Court in Washington, D. C., his arguments securing the case for his clients and leading to the only reversal of a decision by the United States Supreme Court that had ever occurred. He published 'History of the Negotiations in Reference to the Eastern and Northeastern Boundaries of the United States' (1841); 'Belligerent and Sovereign Rights as Regards Neutrals During the War of Secession' (1873); 'Disabilities of American Women Married Abroad' (1871); 'Administration of Equity Jurisprudence' (1874); etc.

Lawrence, Kan., city and county-seat of Douglas County, on both sides of the Kansas River, and on the Atchison, T. & S. Fe and the Union Pacific R.R.'s; 40 miles west of Kansas City. It is the farming trade centre for Douglas and parts of two other counties; and is principally engaged in manufacturing, which is greatly promoted by the excellent water power furnished by the river. It is the seat of the Kansas State University, Haskell Institute, and Government Indian Industrial School; contains a hospital, public library, and several public parks; and has flour and paper mills, barbed-wire, ice, shirt, sash and door factories, and foundry and machine shops. There are electric light plants, waterworks, several National and State banks, daily, weekly and monthly periodicals, and an assessed property valuation of over $1,000,000. The city was settled by an anti-slavery colony from the East in 1854 and was named in honor of Amos A. Lawrence. It was the first of the Kansas Free-State towns founded by the Emigrant Aid Society, soon after the passage of the Kansas-Nebraska Bill (q.v.). In 1856 a band of Missouri border ruffians sacked the town, which was defended by old John Brown (q.v.) and his sons. In 1863, the Confederate raider Quantrell attacked the town and killed 125 citizens. Pop. (1890) 9,900; (1900) 10,862.

Lawrence, Mass., city, and one of the county-seats of Essex County, on both sides of the Merrimac River, and on the Boston & Maine railroad, 26 miles northwest of Boston. It is one of the notable and leading manufacturing cities in the valley of Merrimac River, a stream fed mainly by the network of small rivers, brooks and storage lakes, rising in or lying at high levels, among the mountains and highlands of New Hampshire. Built at the lowermost available rapid upon the river, the city has the concentrated power of all the tributaries of that stream and receives benefit from the entire watershed feeding the main current — an area of 4,450 square miles. The water power developed at this point, amounting to about 15,000 horse-power, is remarkably uniform and reliable.

Water Power Plant.— In 1845–8 the «Great Stone Dam,» located at Bodwell's Falls, near the old historic «Andover Bridge,» was built of hammered granite. When finished this structure was considered the most complete and durable work of the kind then existing in America. It was bedded upon the underlying strata of blue stone or Merrimac schist, and was so thoroughly constructed that it has stood to this day without alteration or addition, seemingly a part of the ledges between and upon which it was built. This dam concentrated at one point, the power of three successive natural river rapids, the accomplished result being a fall of 26 feet, increased in height, when needful, by flashboards, to 30 feet. The overfall of water is in one unbroken sheet over a crest, nearly straight in line, 900 feet in length between the granite abutments. In addition to this unbroken span of solid stonework the protecting wings of the dam are 729 feet in combined length. There are two main canals, one along the northern bank of the river, one mile in length, and another upon the southern side, one half mile long; these distribute water power to the large mills and workshops. Steam power is also used in addition, by nearly all manufacturers, and, in some instances, it is exclusively relied upon.

Manufacturing and Business.—Lawrence may well be known to Americans as «The Worsted City,» for the United States census of 1900 shows that, in the production of worsted and woolen dress goods, Lawrence leads in New England; the sum invested in that distinct business being $29,854,901, and the value of goods produced annually $25,584,744. Compared with the producing centres of the entire country, Lawrence leads in the amount of capital invested in any one locality in the worsted and woolen dress goods industry, and in the value of that class of goods produced it is exceeded only by Philadelphia. It has been estimated by experts that the wool clip from about 12,000,000 sheep is used annually in the worsted and woolen mills of the city. Among wool growers and dealers of the world, the city is known as a leading consumer of that staple.

The three great manufacturing companies that lead in importance are Pacific Mills, having 5,600 people engaged in producing calicoes, lawns, delaines, serges, and other worsted dress goods, the American Woolen Company's Washington Mills, employing over 6,500 operatives in the making of worsted and woolen goods for men's wear, and Arlington Mills with nearly 5,000 people employed in the manufacture of ladies' worsted dress goods, worsted yarns, mercerized cotton yarns and «Worsted Tops» as specialties. The many other concerns producing textile fabrics are thriving and important. The making of book, news, cartridge and calendered papers is an established industry of much importance, and paper mill machinery is constructed on quite an extensive scale by enterprising companies and firms. The making of shoes is carried on to a limited extent.

Site and Environment.— The site was peculiarly adapted in its character and surrounding to the building up of an important industrial centre. The small Spicket River here enters the Merrimac from the north and the winding, shaded Shawsheen stream enters from the south. The location is healthful — a rolling plain flanked by low protecting hills. The topography of the site favored economical development. The rapid Merrimac River divides the city into nearly equal sections; the northern half has come to most importance and has the largest population and most important industrial establishments. The city was laid out in 1845–6 by the founders and promoters, and has been built largely in accordance with original plans. The principal streets make a slight angle at a turn in the river and are arranged to intersect with great regularity.

Public Works and Buildings.— The public works were liberally planned and thoroughly built. The waterworks, established in 1874–5, were so ample, in all the main features of the system adopted, that extensions have not made it necessary to reconstruct the pumping plant or the storage reservoirs. The source of water supply is the Merrimac River. The filtration beds that cleanse the current before it is distributed for use, were designed by an eminent sanitary engineer and constructed, in 1892, under the care and approval of the Massachusetts State Board of Health. The system was successful and has attracted the attention of the scientific in our own and foreign countries. Similar or modified plans have since been extensively adopted elsewhere. The experimental station of the Massachusetts State Board of Health, where important experiments in sanitation are constantly tried and tested by experts, is established here. Illuminating and heating gas and electric lighting and power are supplied by a single chartered company that well serves the public needs. The new court-house, erected in 1903, costing about $250,000, is architecturally beautiful in design and commodious and complete in furnishing and outfit. A new post-office or United States government building, costing $150,000, is in process of erection. No more commodious school buildings can be found in any city of the same population and class. The old city hall — the original «Town House,» served, for a quarter century, almost every conceivable public use and is still a noticeable structure, answering the purpose for which it was erected.

Parks and Pleasure Grounds.— The founders of the city wisely reserved a common, of 17 acres, at the very centre of the business and residence section, as a public pleasure ground. No buildings are allowed upon this central park and no public reserve in the commonwealth is more nobly wooded or more truly the people's ground. About this central park the largest public buildings, the leading Protestant churches and many of the best residences are grouped. Four large outlying parks, in a nearly wild condition, but of much natural beauty, and several smaller squares are well cared for by an established park commission of five members. A playstead of several acres, exclusively for games and athletic exhibitions, is conveniently located.

Banks and Savings Institutions.— Five national banks have become established and are of undoubted stability. The three savings banks have deposits amounting to $15,000,000, largely the savings of working people.

Churches and Charities.— There are 40 organized churches in the community, the Roman Catholics having much greater numbers and larger value in property than any one denomination and nearly equaling the other sects combined. There is an organized city mission. A General Emergency Hospital and Children's Home are maintained by the Ladies' Union Charitable Society, a Protectory or Asylum for orphans or destitute children, an endowed Home for Aged People, and every nationality in the community has its own relief, benefit, or social societies.

Government, Schools, Free Libraries and Lectures.— Municipal control is in the hands of a mayor, six aldermen, and 18 councilmen, all elected annually. The number of wards (six) and the number of government members has not changed since the first acceptance of the original charter. There are 30 organized public schools, the high school having 700 pupils housed in a new, elegant and commodious building recently erected at a cost of $250,000. The lower grades are accommodated in houses of modern construction and furnishing. Evening schools are maintained as a part of the public school system and give to workers of every age and nationality a chance to advance in classical or English studies and also give special instruction in penmanship, mechanical and freehand drawing, bookkeeping and the natural sciences. A free course of lectures especially for industrial classes, upon scientific and miscellaneous subjects, has for many years been sustained by endowment. The free public library of over 50,000 volumes is patronized by all classes. The main library building was the gift of a generous citizen.

History.— Previous to 1845 the territory now included within city limits (about seven square miles lying in form nearly a square) was an unimportant section of two old, historic towns — Andover and Methuen. The inhabitants of the site numbered only about 350 souls and were nearly all the families of quiet farmers or river-men; there was not a church building, warehouse for trade, or manufacturing establishment of any importance then standing in the entire district. In 1845–6 an associated company of manufacturers, financiers and merchants, the leading pioneer manufacturers and progressive business men of prominence in Massachusetts, after critical examination becoming satisfied regarding the rare value of the water power and, recognizing the peculiar fitness of the site for a manufacturing city, associated themselves together and procured an act of incorporation under the name of the Essex Company, chartered for the purpose of developing and controlling the water power and establishing factories and workshops at or near the site they selected. This company purchased lands covering nearly half the area of the contemplated town and secured land or flowage rights for several miles above the site chosen for the projected city. These associated founders and promoters decided to locate at the lowermost of three successive Merrimac River rapids below Lowell, at the confluence of the Merrimac, Spicket and Shawsheen rivers. Promoted, as the Lawrence building and manufacturing enterprise was, at the outset, by responsible and powerful sponsors, the «New City,» as it was at first called, rapidly developed and became almost at the beginning important as an industrial centre. In less than two years from the commencement of operations in 1845, the settlement was organized as a separate town, taking the name of Lawrence in honor of the eminent merchant manufacturers of that name who were so deeply interested in establishing the town and city.

The city has had its calamities. Its industrial enterprises survived the financial reverses of 1857–8–9, only because of powerful support given by loyal defenders and business leaders. This time of trial was succeeded by the gloom attendant upon the «Fall of Pemberton Mill,» 10 Jan. 1860, an occurrence that enlisted the interest and sympathy of the entire country. In the War of the Rebellion the city's volunteers were among the first to respond to the call for troops and were among the first to engage in conflict. A citizen, Sumner H. Needham, was the first martyr to fall in the ranks of the patriot soldiery in April 1861.

Local Characteristics.— The cosmopolitan character of the population is particularly noticeable. Forty-five per cent of the people were born in foreign lands and only about 25 per cent of the number are of full native parentage. The greatest immigration has been from Ireland, the British Isles, Germany, Canada, and considerable numbers from every nation of continental Europe and from some Oriental countries. Pop. (1900) 62,559; (1904 est.) 68,000.

Robert H. Tewksbury,
President of the Lawrence Savings Bank.

Lawrence, The, Commodore Oliver Hazard Perry's flagship at the Battle of Lake Erie in the War of 1812.

Lawrence, Saint, Gulf of. See Saint Lawrence Gulf.

Lawrence Scientific School, The, a part of Harvard University, Cambridge, Mass.; founded by Abbott Lawrence in 1847. The primary object of the institution was to afford an opportunity for special study and training in science which the then existing foundations and departments of the university did not offer. Not the least of the important benefits it conferred during the earlier years of its existence was the bringing of Prof. Louis Agassiz into close relations with the university, a special chair of zoology and geology in the scientific school having been created for him by Mr. Lawrence in 1848. It was originally intended that the Lawrence Scientific School should be independent of Harvard College, and for many years it was so maintained, but in recent years it has gradually become merged with it. until it now forms a part of the university, its government together with that of the college and the graduate school being under the faculty of arts and sciences. The courses offered include civil engineering, electrical engineering, mechanical engineering, mining and metallurgy, architecture, chemistry, geology, biology, general science, science for teachers, and anatomy and physiology. So far as possible the instruction relates rather to the principles of science than to technical work, the intention being to make the graduates ready for the apprenticeship of their professions. See Harvard University.

Lawrence University, Appleton, Wis., a Methodist Episcopal institution founded in 1847, and named in honor of its principal donor, Amos A. Lawrence, of Boston. In 1902 it had 34 professors and instructors, 600 students, 16,964 volumes in the library, and productive funds, $205,020; grounds and buildings valued at $210,000; benefactions, $7,000; income, $28,000.

Lawrenceburg, lâ'rëns-bėrg, Ind., city and county-seat of Dearborn County, on the Ohio River, and on the B. & O. and the C. C. C. & St. L. R.R.'s, 22 miles west of Cincinnati, Ohio. It was settled in 1817 and was first incorporated in 1847. The government is administered by a mayor, elected every four years, and by a city council, elected every two years. It has manufactures of flour, edge-tools, burial caskets, tube-well supplies, whiskey, wagons, barrels, etc. Pop. (1890) 4,284; (1900) 4,326.

Lawrenceville (lâ'rēns vĭl) **School, The,** an American college preparatory school at Lawrenceville, N. J., originally founded in 1810 but refounded in 1882 as an endowed school known as the «Lawrenceville School on the John C. Green Foundation,» at which time the English «home system» was adopted. In scope it corresponds to such English schools as Harrow or Rugby, and now contains about 400 pupils, with some 32 masters. There are 11 master's houses, with an Upper House and the Hamill House for the boys of the upper form, managed by boards of directors appointed by the boys themselves. There are five forms, each corresponding to one year's work. In addition to the buildings already named there are a large stone chapel, a spacious building for class-room exercises called Memorial Hall, and an immense gymnasium with swimming-pool, erected in 1902. Lawrenceville itself is a small village five miles northeast from Trenton and about the same distance from Princeton, southwest.

Law'son, Cecil Gordon, English painter: b. Wellington, Shropshire, 3 Dec. 1851; d. London 10 June 1882. He exhibited at the Academy, in 1870, but many of his pictures were rejected by the hanging committee till 1878, when his 'Minister's Garden' and a 'Pastoral' at the Grosvenor made him famous. He was highly esteemed by the poet-painter Rossetti, and his works are now much valued. Consult: Gosse, 'Cecil Lawson, A Memoir.'

Lawson, John, American colonial surveyor-general: d. 1712. He was of Scotch birth; began his surveys in 1700, and was an intelligent observer, enterprising and circumspect, but fell a victim to the jealousy of the natives, who confounded the surveyor of their territory with those who despoiled them of it. He was captured by them during one of his explorations when in company with De Graffenried, a Swiss baron who contemplated colonization. The latter was permitted to buy himself free, but Lawson failed to propitiate their hostility and perished by the fire torture. He left one of the most valuable of the early histories of the Carolinas, of their feeble condition, their resources and aspects, and their principal aboriginal tribes. It is entitled 'A New Voyage to Carolina, containing the Exact Description and Natural History of that Country, together with the Present State thereof; and a Journal of a Thousand Miles Traveled through Several Nations of Indians, giving a Particular Account of their Customs, Manners, etc.' (1709). The volume is a quarto of 258 pages, well illustrated with one of the best maps of the time, and with various other engravings, chiefly in natural history. It is now rare.

Lawson, Victor Fremont, American newspaper publisher: b. Chicago 9 Sept. 1850. He was educated at Phillips Academy, Andover, Mass. He inherited from his father an interest in a printing establishment, and in 1876 bought the Chicago *Daily News*, which, with his partner, he developed successfully, starting a morning edition in 1881 under the name of the *Record*. In 1888 he bought out his partner and became sole proprietor; in 1901 the *Record* was merged with the *Times-Herald*. He has been president of the Associated Press; has also been active in philanthropic work, and started the *Daily News* Fresh Air Fund, which supports a sanitarium for sick children of the poor.

Lawson, Sir Wilfrid, English statesman: b. Cumberland, England, 4 Sept. 1839. He early came into notice as a temperance advocate. In 1859 he was elected to Parliament, and in 1864 introduced a "Bill for the legislative suppression of the liquor traffic." In 1868 he was re-elected to Parliament with Mr. Gladstone's party as member for Carlisle. His local option bill passed in 1880, 1881, and 1883. After serving in Parliament two subsequent sessions he lost his seat in 1900. He is president of the United Kingdom Temperance Alliance.

Lawson's Cypress. See Cypress.

Law'ton, Henry Ware, American soldier: b. Manhattan, Ohio, 17 March 1843; d. San Mateo, Luzon, 19 Dec. 1899. He entered the military service as a private 16 April 1861; became captain 17 May 1862. He was mustered out 25 Nov. 1865, but entered the regular army as second lieutenant the next year; was transferred to the Fourth cavalry in 1871; and promoted to captain 20 March 1879. In 1876 he was conspicuous in the expedition against the hostile Sioux, took part against the Ute Indians in Colorado, in October 1879, and in the spring of 1886 was selected by Gen. Miles to lead a picked body of troops into Mexico in pursuit of Geronimo. At the end of three months Geronimo and his band were captured. At the beginning of the Spanish-American War Lawton was a lieutenant-colonel, and was made a major-general of volunteers 8 July 1898. He was in command of the Second Division of the Fifth army corps before Santiago, and at the close of the war was transferred to the Philippines where he began active operations against the insurgents and after capturing Santa Cruz, a Filipino stronghold, 10 April 1899, and San Isidro, 15 May, was placed in command of Manila, 1 June. In the autumn he began an offensive campaign looking toward the capture of Aguinaldo, and was killed in the battle of San Mateo.

Lawton, Okla., city and county-seat of one of three counties formed from the Comanche reservation and added to Oklahoma Territory, 6 Aug. 1901. By the day set for opening the town site to settlers, 25,000 people were encamped close to the town limits, forming a tent frontage of 8 miles. The city is named for Gen. Henry W. Lawton (q.v.), American soldier killed in the Philippines. The entire tract added to Oklahoma is larger than the State of Connecticut and contained within three months from the opening about 50,000 inhabitants. The other county-seats are Anadarko and Hobart.

Lay, Benjamin, British-American philanthropist: b. Colchester, England, 1677; d. Abington, Pa., 1759. His parents were Quakers, and he illustrated in his life the humane principles which the Society of Friends has so long conspicuously represented. At 18 he adopted a sailor's life, and for some years followed the sea. In 1710 he was married and lived again for a while at Colchester; afterward went to Barbados, where he became a merchant; but having aroused hostility by his denunciations of slavery, removed from the island to Philadelphia, where his anti-slavery agitation was continued. Of numerous tracts which he wrote on slavery one was published by Franklin, entitled 'All Slave-Keepers, that Keep the Innocent in Bondage, Apostates.' He was influential in bringing the Friends in this country to take a more decided stand against slave-holding. He did not, however, confine his reforming endeavors to one direction, but labored for a more humane treatment of criminals, and discouraged the eating of animal food, and the using of tea and tobacco. He is described as a singular figure, dwarfish and hunchbacked, and presenting an appearance of poverty. He was buried in the Friends' burying-ground at Abington.

Lay, Henry Champlin, American Protestant Episcopal bishop: b. Richmond, Va., 6 Dec. 1823; d. Easton, Md., 17 Sept. 1885. He was graduated at the University of Virginia, ordained deacon (1846) and priest (1848). He was consecrated missionary bishop of the Southwest (1859) and translated to the diocese of Easton (1869). During the Civil War the Episcopal charge of Kansas was assigned to him, that State being then erected into a diocese. The revision of the lectionary was largely due to Bishop Lay; while he was engaged on the Standard Prayer Book up to his death.

Lay, John Louis, American inventor: b. Buffalo, N. Y., 14 Jan. 1832; d. New York April 1899. In July 1862 he was appointed second assistant engineer in the United States navy, and in 1864 invented a new torpedo. By means of this apparatus Cushing destroyed the Albemarle, a Confederate ram. When Admiral Porter advanced up the James River after the evacuation of Richmond, Lay was employed to clear away the submarine obstructions. He was engaged by the Peruvian government to mine the harbor of Callao, in view of a Spanish attack, but his main work as an engineer and inventor was the construction of the dirigible torpedo, which bears his name and was purchased by the United States Government.

Layamon, lā'ya-mŏn, or **Laweman,** lâ'man, British chronicler. He lived early in the 13th century, and was a priest ministering at Radstone, now known as Areley Regis, on the Severn, in Worcestershire. He is the author of a metrical romance, ‘The Brut.’ which is mainly an amplified version of the French ‘Brut d'Angleterre,’ the latter being itself a compilation with additions from Geoffrey of Monmouth's ‘Historia Britonum.’ As history or literature its value is slight, but it is of high philological importance, and exhibits the English language in its period of transition and before it had become Gallicized, as in the ‘Canterbury Tales’ of Chaucer. In fact, there are not more than 90 words derived from the French in the whole poem of 56,000 lines. Consult the London Society of Antiquaries' edition of ‘Brut,’ edited by Sir Frederick Madden (1847).

Layard, lā'ard, **Austen Henry,** English traveler and archæologist: b. Paris 5 March 1817; d. London 5 July 1894. He was of a family originally French; was partly educated in Italy; began to study law, but gave up this work and entered upon a course of travels in the East. Before he was 23 he had traveled in most of the larger European countries; in 1840 he was on the banks of the Tigris; and before the end of his career had “won distinction as a traveler, archæologist, politician, diplomatist, and student of the fine arts.” In 1845 he began the excavations in Assyria (q.v.) for which he first became celebrated. The results of his discoveries on the site of Nineveh (q.v.) were published in 1849-53. In 1849 he was appointed attaché to the British embassy at Constantinople. At first he paid his own expenses in his researches, but afterward received generous assistance from Lord Stratford de Redcliffe, then English ambassador in Constantinople; and still later £3,000 voted by the House of Commons was used by the trustees of the British Museum for continuing Layard's excavations. He received from Oxford the degree of D. C. L. In 1852 he entered Parliament as a Liberal, and became under-secretary of state for foreign affairs in 1860. He was lord rector of the University of Aberdeen, 1855-6; in 1860 was again elected to Parliament, and 1861-6 again under-secretary of state for foreign affairs; in 1868 was appointed chief commissioner of works and privy councillor; went to Spain in 1869 as British ambassador; and 1877-80 was ambassador to the Ottoman Porte. In 1878 he received the Order of the Bath, and was made a foreign member of the Institute of France in 1890. He wrote much on the history of painting, was a leading spirit in the Arundel Society, and a trustee of the National Gallery. His writings include ‘Nineveh and Its Remains’ (1849); ‘Nineveh and Babylon’ (1853); ‘Monuments of Nineveh’ (1849-53); ‘Inscriptions in the Cuneiform Character from the Assyrian Monuments’ (1851); ‘Early Adventures in Persia, Susiana, and Babylonia’ (1887, 1894). Consult his ‘Autobiography’ (1902).

Laycock, lā'kŏk, **Thomas,** English physiologist: b. Wetherby, Yorkshire, England, 10 Aug. 1812; d. Edinburgh, Scotland, 21 Sept. 1876. He was the earliest to put forth the theory of the reflex action of the brain. This was in 1844, and in 1855 he became professor of the practice of physic and of clinical medicine at Edinburgh University. He published ‘Mind and Brain’ (1860); ‘Methods of Medical Observation’; etc., and wrote many professional papers on sanitary science, insanity, etc.

Lay'ering, in horticulture, is a mode of propagating plants by bending down a young branch and covering part of it with earth, thus causing it to shoot forth roots before it is separated from the parent stalk. The portion covered with soil has often a notch cut in it below, or a tight ligature is applied. The free return of the sap is thus prevented, and the formation of roots from buds is promoted. The time which must elapse between the cutting or binding of the shoot and its separation from the parent plant varies greatly, a few months sufficing in some cases, while two years are requisite in others. This mode of propagation is employed for pinks, hortensias, heaths, gooseberries, etc.

Laynez, lī'nāth, or **Lainez, Diego,** dē-ā'gō, second general of the Jesuits: b. Almancario, near Siguenza, Castile; d. Rome 19 Jan. 1565. He studied in Alcala and Paris, in which latter town he joined with Ignatius Loyola in founding the order of Jesuits. His especial work was to travel over Europe to gather new members, and spread the influence of the order, when the constitution of the order had been confirmed and approved by Pope Paul III. 1540. He was very successful in extending the Society of Jesus. He was a man of marked ability and as a consulting theologian took a conspicuous part in the Council of Trent. He had succeeded Loyola as general of the Jesuits in 1556. On the death of Paul IV. he avoided the chance of election to the tiara, and refused a cardinal's hat. Consult Boero, ‘Vie du P. Jacques Lainez’ (1894).

Lazaret'to, a name given in Italy, and other parts of southern Europe, and also in Hawaii and in California, to isolated hospitals for such as are afflicted with contagious disorders. The name is derived from Saint Lazarus, who is the patron saint of lepers; and during the Middle Ages, when leprosy was common in Italy and other parts, the hospitals in which the lepers were confined received that name, and the lepers themselves were called lazzari. Howard wrote ‘An Account of the Principal Lazarettos in Europe’ (1789). Those buildings and enclosures attaching to seaport towns chiefly on the Mediterranean, where the crews and passengers of ships from places where contagious disease is known to prevail, are also called lazarettos. These lazarettos consist generally of various detached buildings, with courts between, the whole being surrounded by a wall, and placed in an airy situation outside the town, or sometimes on a small island near the coast. See also QUARANTINE.

Laz'arists, or **Fathers of St. Lazarus,** a congregation of the Roman Catholic Church, originally known as «Priests of the Mission,» founded at Paris by St. Vincent de Paul in 1625 for the purpose of supporting missions and ministering to the spiritual wants of the poor at home, and in foreign parts, especially Barbary. The foundation was confirmed by letters-patent of Louis XIII., May 1627, and the missionaries were erected into a congregation by Pope Urban VIII. in 1631. At the time of the Revolution they included 1,195 members and 63 houses. In 1817 they established themselves in the United States.

Lazarus, lăz'ạ-rŭs, **Emma,** American poet: b. New York 22 July 1849; d. there 19 Nov. 1887. Trained at home under the personal direction of her father, Moses Lazarus, a New York merchant of prominence in the social and business world, she early displayed intellectual promise. From her childhood books were her most precious possession and her mind was turned to poetry for its utterance — the Civil War inspiring her first lyric outbursts. Her earliest productions, ‹Poems and Translations› (1867), were marked by a seriousness if not sombreness, incomprehensible in one so young, whose life, too, was full of happy anticipations. In her second volume, four years later, there was more artistic completeness, and a certain consciousness of power gave more strength to her verse. Her ‹Admetus and Other Poems› (1871) was favorably received, and its classic atmosphere showed distinct talent, while, side by side with its imaginings in ‹Admetus› and ‹Tannhäuser› were its flashes of personal experience in ‹Epochs› and the musical rhapsodies in ‹Phantasies.› In 1874 her love for German literature was evidenced in her ‹Alide,› a story of Goethe's Sesenheim period, so far as its background is concerned, wherein she has admirably incorporated whole passages from the ‹Autobiography› to give naturalness to the episode. It is a charming romance, which won high praise from Tourgeneffs as the work of one who «is not a pupil in art any more» and «is not far from being a master.» Her next book printed for private circulation, ‹The Spagnoletto› (1876), a five-act tragedy of the 17th century, was remarkable at least for the new note in treatment, its stormy sweep of passion, so unlike the calm, reflective emotion of her precious poems. It was in 1878, when she was giving the finishing touches to translations from Heine, that a new theme was suggested to her — the translation into English of representative Jewish poets of the Spanish school. With enthusiasm she responded to the appeal, and, desiring to reproduce the spirit of the original, studied Hebrew with rare diligence and soon grew independent of German paraphrase. The ease with which she mastered the mediæval Jewish poets and the interest she displayed in Jewish history were preparations for a more important work. A little volume was shown her — ‹Der Tanz zum Tode› by Reinhard, based on historical data furnished by Franz Delitzsch, as a more elaborate treatment. Her ‹The Dance to Death› was the result, for which she was unable to find a publisher until it was issued as a serial in a Jewish weekly, and appeared about the time of the Russian Jewish persecution of 1882, although it was written without any reference to those outbreaks. In the American movement to aid the refugees, she took a helpful part. She wrote in ‹The Century› (May 1882) an impassioned article, ‹Russian Christianity *versus* Modern Judaism,› wherein she championed her brethren and reputed their critics and assailants. In prose and verse she further strove to vindicate her ancestral creed and inspire its followers to brotherhood and useful activity. In ‹The Century› for February 1883 she pleaded for «a restored and independent nationality and repatriation in Palestine.» After her father's death in March 1885 her own health failed slowly and the end came in November 1887, just at the time when her powers were ripest and her opportunities seemed at their greatest. In addition to the volumes already named she published ‹Poems of Heinrich Heine› (1881); ‹Songs of a Semite›; ‹The Dance to Death, and Other Poems› (1882). Her collected poems were issued in two volumes in 1889.

A. S. ISAACS,
New York University.

Lazarus, Jacob H., American painter: b. New York 4 Oct. 1822; d. there 11 Jan. 1891. Displaying early in life marked artistic taste, before his manhood he became a pupil of Henry Inman (q.v.), but soon established a studio of his own, and for nearly 50 years was a successful artist. In addition to his ability as portrait painter, he was an admirable critic of art in general. He painted the portraits of many eminent men of his time, among them those of Governors Sewell, Hubbard, English, and Walcott, of Connecticut; Governor Hoffman, of New York; John Van Buren, for the Manhattan Club; Gen. Schuyler, for the city of Philadelphia; Maj.-Gen. Halleck; Dr. Fordyce Barker, for the Academy of Medicine; John Amory Lowell and members of his family, for Harvard University; and the Rev. James Freeman Clarke. A scholarship bearing his name was given to the Metropolitan Museum of Art by his widow and daughter, supported by an endowment fund of $24,000, the interest of which is awarded annually to the most proficient male pupil in the class of painting organized by the art school of the museum.

Laz'enby, William Paul, American scientific agriculturist: b. Bellona, N. Y., 5 Dec. 1852. He was graduated in agriculture at Cornell (1874) and elected teacher of botany, horticulture and forestry in that institution. He later was appointed on the staff of Ohio State University and for six years held the position of director of the Ohio Agricultural Experiment Station. He belongs to many scientific and agricultural societies, and has done much good service in lecturing before farmers' institutes and other associations. He is at present professor of horticulture and forestry in the Ohio State University, and secretary of the Ohio Medical University.

Laz'uli Finch, a small brilliantly blue finch (*Cyanospiza amœna*) of the Western States, frequently kept as a cage-bird. It is much like its relative, the eastern indigo-bird (q.v.).

Laz'ulite, a mineral, which is not to be confused with lapis lazuli (q.v.), is found in Austria, Switzerland, Sweden, Brazil, and in North Carolina and Georgia. It occurs massive, and also well crystallized in monoclinic crystals of steep-pyramidal habit. It has a fine blue color and vitreous lustre, and is semi-translucent. It is moderately hard, but brittle; specific gravity, 3.1. It is a hydrated phosphate of aluminium, iron, and magnesium, but it also contains lime, and sometimes silica.

Lea, lē, **Henry Charles,** American author: b. Philadelphia 19 Sept. 1825. He entered his father's publishing house in 1843; became its head in 1865; and retired from business in 1880. He has actively engaged in public undertakings for civil and social advancement, and during the Civil War rendered conspicuous services in support of the Federal government. Between 1840 and 1860 he wrote many papers on chemistry and conchology, and after 1857 devoted his attention to European mediæval history. His chief works are: ‘Superstition and Force’ (1866); ‘An Historical Sketch of Sacerdotal Celibacy in the Christian Church’ (1867); ‘A History of the Inquisition of the Middle Ages’ (1888); ‘Chapters from the Religious History of Spain’ (1890); ‘Formulary of the Papal Penitentiary in the Thirteenth Century’ (1892); ‘A History of Auricular Confession and Indulgences in the Latin Church’ (1896); ‘The Moriscos of Spain: Their Conversion and Expulsion’ (1901). He was a son of Isaac Lea (q.v.).

Lea, Isaac, American naturalist: b. Wilmington, Del., 4 March 1792; d. Philadelphia 7 Dec. 1886. In early life he engaged in commercial pursuits, and from 1821 to 1851 was partner in a large publishing business; but from boyhood he was devoted to the study of natural history, and his various collections of minerals and fossils, and especially of shells, were valuable contributions to science. He was a member of the Academy of Natural Sciences of Philadelphia, and of the Philosophical Society of the same city, in whose ‘Transactions’ many of his observations were published; he was also elected to membership in learned societies abroad. His work in the study of fresh-water and land mollusks brought him special distinction. His principal publications are: ‘Observations on the Genus Unio’ (1827–33); ‘Synopsis of the Family of Naiads’ (1852–70). In the National Museum at Washington his vast collection of *Unionidæ* and his gem collections are deposited. Consult: Scudder, ‘Bulletin U. S. National Museum,’ No. 23 (Washington). An account of Lea's work in conchology was published at Philadelphia in 1861 by G. W. Tryon, Jr.

Lea, Matthew Carey, American chemist: b. Philadelphia 1823; d. there 15 March 1897. His work in developing the chemistry of photography has served important purposes. Besides many articles treating of the chemical action of light, his publications include an authoritative ‘Manual of Photography.’ He was the eldest son of Isaac Lea (q.v.).

Lea'cock, Hamble James, American missionary: b. Cluff's Bay, Barbados, 14 Feb. 1795; d. Sierra Leone, Africa, 20 Aug. 1856. He was educated at Codrington College, Barbados, took deacon's orders in 1826, and became assistant priest of St. John's parish, where he aroused great opposition by freeing his own slaves and offering to all slaves within the parish the privileges of the Church. Subsequently he was stationed at St. Vincent, and was pastor of St. George's, Charlestown, Nevis, whence he removed in 1835 to Lexington, Ky. From 1836 he held various pastorates, in 1848–55 was again in Barbados, and in 1855 went to Africa as the first volunteer of the West Indian Church Association for the furtherance of the Gospel in West Africa. He developed a large mission field at Rio Pongas, Sierra Leone. Consult the biography by Caswall (1857).

Lead, lĕd, S. Dak., city in Lawrence County; on the Chicago & Northwestern and the Burlington & Missouri River R.R.'s; about 18 miles from the western boundary of the State. It was settled in 1876 and incorporated in 1877. It is situated in the Black Hills in a gold mining region. The chief industries are connected with mining, the manufacturing of mining tools and the outfits for mining camps. Some of the largest mines in the vicinity are the Homestake Gold Mining Company, which employs about 5,000 men; the Hidden Fortune Gold Mining Company, employing about 500; and in several other mines about 5,000 more miners are employed. The modern methods of mining have made the Black Hills (1903) the third largest gold producing region in the world, and Lead receives its share of the industrial plants connected with preparing the ore for market. The educational institutions are the public and parish schools, Black Hills Business College, the Hearst Free Kindergarten, and the Hearst Free Library. The Lead Coliseum and several churches are among the prominent buildings. The combined capital of the banks (1903) is $50,000; and the value of the business transacted annually is about $17,000,000. The government is vested in a mayor and a council of 10 members, two from each ward. Pop. (1890) 2,581; (1900) 6,210; (1903) 11,000.

Joseph Feeney,
Secretary Commercial Club.

Lead, one of the useful metallic elements, well known in chemistry and in the arts. From early times references to it are found in literature. It is mentioned in Exodus xv. 10, Numbers xxxi. 22, Job xix. 24, and Ezekiel xxvii. 12, and is supposed to have been imported into Palestine from Tyre, although it should be remembered that there are lead mines in Sinai and the Lebanon, as well as in Egypt. Articles made of lead by the ancient Romans, such as water-pipes, water-tanks, weights, rings, and small ornamental cylinders, are still preserved. Examples in the grounds of old churches show that the Roman method of making pipes from sheet-lead continued in use till late in the Middle Ages. Small lead-weights of curious forms have been found among Viking remains dating as early as the 10th century. Many of the European countries are known to have produced lead as early as from the 10th to the 14th century. The important lead mines of the world are in Europe and the United States.

Chemical Properties.— Lead (chemical symbol Pb, from the Latin name of the element, *plumbum*, atomic weight about 207), is a soft metal of a bluish-white color, tending to gray, with a bright metallic lustre when newly cut or melted. It soon tarnishes when exposed to the air, taking on a thin film supposed to be suboxide. But lead suffers less than most metals either from atmospheric agencies or damp soils. It can be scratched with the nail, and easily cut, and makes a mark upon paper. Its specific gravity varies from 11.352 in the ingot to 11.365 when rolled into sheets, and it melts at about 619° F. (326° C.). It is highly malleable and in a less degree ductile, but its tenacity is small — a wire 1-12th of an inch being unable to carry a load of 20 pounds. Lead is not a good conductor of heat or electricity. When gently heated it can be forced by pressure through perforations, and pipes. Water containing carbonic acid has a slight action on lead, carbonate being formed and dissolved, but this action is apparently hindered by the presence of some salts and accelerated by others. When lead is heated to redness in air it is oxidized, litharge (PbO) being formed. Lead is attacked by nitric acid and by hot strong sulphuric acid, but dilute sulphuric or hydrochloric acids have but little action. It is therefore largely used for the construction of sulphuric acid chambers and for chemical works plants. It alloys readily with many metals.

Lead Oxides.— Five oxides of lead are known, namely, the suboxide (Pb_2O), the monoxide (PbO), the sesquioxide (Pb_2O_3), the red oxide (Pb_3O_4), and the dioxide (PbO_2). Of these, however, only three — the monoxide, the red oxide, and the dioxide — are of any importance. Lead monoxide (PbO), litharge, massicot, is largely used in the arts, and is made by heating molten lead in a shallow reverberatory furnace with free access of air, the litharge as it forms being pushed on one side so as to expose a fresh surface of the metal. The mass thus obtained is ground and separated from intermixed lead. It is then the buff-colored powder known as ground litharge or massicot. When the oxidation takes place above the melting point of the oxide, as in cupellation, the litharge on solidification breaks up into orange-colored scales and is then known as «flake litharge.» Litharge melts at about 600° C. to a clear liquid, and at higher temperatures volatilizes. Lead oxide is a powerful base and dissolves in acids forming salts. At high temperatures it combines readily with silica, forming fusible silicates, and therefore has a very corrosive action on crucibles or firebricks which contain silica. An electrolytic process of making red lead and litharge from galena is used at Niagara Falls. When litharge is heated to dull, redness with free access of air, oxygen is taken up and the red oxide (Pb_3O_4) red lead is formed. It is manufactured by roasting ground litharge with free access of air for about 24 hours; the operation being carried on till the required tint is obtained on cooling. It is used as a pigment.

Lead Ores.— Until recently only a small quantity of lead was obtained from any other ore than galena (PbS). Galena (q.v.) is found extensively, more or less pure or associated with other ores, in various parts of the United States, in Great Britain, Germany, Spain, and other European countries. The production of lead in the United States has become a very important feature of the world's industries. The richest ores are found chiefly in the Western States, the carboniferous limestone, bearing both hard and soft ores, which contain silver chloride and cerussite. The output of smelting-works in Colorado, Idaho, Missouri, Montana, Utah, etc., figures largely in the industrial statistics of the country. (See LEAD INDUSTRY, AMERICAN.) At the present time the main supply of lead is obtained from the Rocky Mountain regions, where the ores are argentiferous — as to some extent all galena is — and the lead-silver mines in some of the States mentioned have produced much wealth for their owners. Conde lead is imported into the United States from British Columbia and Mexico. Other minerals associated with galena are anglesite or sulphate of lead, lanarkite, which is a basic sulphate, pyromorphite, or phosphato-chloride of lead, and bournonite, consisting of the sulphides of lead, copper, and antimony. Galena is very heavy and usually can be easily separated from most of the lighter minerals with which it is associated. The heavier minerals, such as barytes, pyrites, and blende, are not so easily or completely separated. In Great Britain the ore is crushed to pass through about a half-inch sieve, and is dressed to contain over 76 per cent of lead. In other countries the concentration is not so high and sometimes no dressing is resorted to. This is specially the case in districts where the blast-furnace is used for smelting, since finely divided material is unsuited for the blast-furnace.

Metallurgy.— Galena is the principal lead ore employed for the purposes which metallurgy (q.v.) now so widely subserves. The next important ores, the sulphate and the carbonate, are seldom treated except in combination with others. The three main processes are the air-reduction, the roasting and carbon reduction, and the iron or precipitation reduction processes. Galena when taken from the mine is broken up into small pieces or reduced to powder, and the impurities, in so far as these can be removed mechanically, separated by machines. If the dressed galena is nearly pure, as it often is, the smelting operation is simple. The processes of lead-smelting — galena being the ore — which have grown up in various parts of the world, are strikingly similar in principle, though differing much in detail. In the United States lead is smelted in reverberatory furnaces made of brick, or in water-jacketed blast-furnaces. The blast-furnace is always preferable to the reverberatory where it can be used, and has now become almost universal for lead-smelting.

Compounds of Lead.— One of the most important lead compounds is plumbic carbonate (carbonate of lead, white lead), $PbCO_3$ — the cerussite of mineralogists, and now largely mined in the United States as an ore of lead. White lead is manufactured on a large scale, and is extensively used in the arts as a white pigment and as a body for other colors in paints. (See PAINT.) Another leading compound is plumbic chloride (chloride of lead), $PbCl_2$. The minerals matlockite and mendipite are both oxychlorides of lead. A basic chloride of lead is made for use as a white pigment, which is, however, not so serviceable as ordinary white lead. Lead acetate (sugar of lead), $Pb(C_2H_3O_2)_2$, $3H_2O$, is prepared by dissolving massicot in dilute acetic acid. It can be obtained in transparent crystals or in scales by evaporating the solution. It is soluble in 1½ parts of cold water, and in eight parts of alcohol. Like litharge, it is used in the manufacture of oil-varnishes. Minium or red lead is much used in the manufacture of flint-glass, as a cement, and as a pigment. For glass-making it requires to be made of very pure lead, as a slight trace of copper would impart a color to the glass. Minium is prepared by heating massicot or monoxide of lead to a temperature of 600° F. in iron trays, in an oven, carefully avoiding fusion. More oxygen is thus gradually absorbed; and a bright-red compound is formed which is the red lead of commerce. Orange lead, made from white lead instead of from massicot, is a very pure kind of red lead. Yellow lead, so called sometimes by manufacturers, is a mixture of the oxides of lead and antimony, which is to some extent used to give a yellow color to earthenware, and as a pigment. The so-called black lead (see GRAPHITE), of which pencils, etc., are made, contains no lead.

Lead in Medicine.— Most of the lead compounds used in medical practice are made into external applications for disorders of the system which manifest themselves upon the skin, although some are employed as sedatives, astringents, etc. Lead acetate is an approved internal remedy in typhoid fever, diarrhœa, and other diseases. Of plasters, ointments, and the like, lead carbonate, lead iodide, and lead oleate are familiar constituents.

Lead Poisoning.— The use of lead in the arts is a frequent cause of painful and sometimes fatal effects, from the metal finding its way into the system. The glazing of culinary vessels with lead; the coloring of confectionery with the chromate, chloride, or carbonate of lead; the sweetening of sour wine by litharge or oxide of lead; the drinking of water which has passed through new lead-pipes; and living much in rooms newly painted with lead-colors, all these things may cause exposure to this peril, and often produce lead or saturnine poisoning. But the most frequent and virulent cases occur among painters and persons engaged in white-lead factories. In lead-poisoning the countenance assumes a sallow, earthy hue, the skin becomes dry and harsh, the digestion is deranged and the bowels constipated, and a sweetish metallic taste is felt in the mouth. A specially important sign is the appearance of a blue or violet line along the margin of the gums and teeth, due to the formation of a sulphite of lead. There is sometimes kidney disease, muscular palsy, severe disturbance of the brain, and even epilepsy and some form of insanity. The most noteworthy result of lead-poisoning is lead-colic, or painter's colic.

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Lead Industry, American. The use of lead antedates written history, and its abundant occurrence in nature and the ease with which it is reduced from its ores, lead archæologists to infer, even when little mention and few traces are found, that the ancient nations were familiar with its properties. In Egypt lead was used as an alloy for bronze, and in native form for small images and amulets. The Egyptian slingers used it for sling bullets, as did the Persians. Greece and Rome knew lead as well as we of to-day. Britain and Spain yielded the Romans thousands of tons. Nearly every land on earth found more or less lead within its borders, and the mining of this metal in a small way was almost universal before the discovery of America. Naturally so base a metal as lead was not the objective treasure of the adventurous miners and metallurgists who first struck their picks into American soil. Gold and silver they sought, and if for many years they found little, their search at least developed many mines and regions, as perhaps the too easy discovery of the yellow metal they coveted might not have done. The first American lead discovered was in 1621, near Jamestown, Va. Iron-smelting works had been erected by the London Company, and an expert metallurgist named John Berkeley was put in charge. Berkeley, in addition to his services rendered to the company, did a little prospecting on his own account, which developed the existence of a vein of galena, the commonest ore of lead. He worked this secretly and supplied his neighbors with lead for bullets and other purposes; but cupidity caused him to keep the location of the vein a secret, so that when, a year or two later, he was killed by Indians, his secret died with him. A few years later a friendly Indian disclosed the location of the old mine, and the lead deposits of Virginia have been worked more or less ever since, although the output has never been very great. Lead was also early discovered in Connecticut and Massachusetts, and by the middle of the last century valuable workings were open in New York State. The lead mines of the East, however, have never been of such importance as those of the great central and western regions of the Upper Mississippi and in Missouri, which were early developed by the French. The lead fields of the Galena district, comprising portions of Iowa, Illinois, and Wisconsin, which have been among the most productive in the world, were probably first discovered and worked by an Indian trader named Nicholas Perrot, who explored from the Canadian settlements of the French as far as the river Des Moines during the last of the 17th century. By 1690 the Indians living in the regions about Galena were smelting and selling lead to the French traders. The region about the present city of Dubuque, which was one of the richest lead districts in America, was also first worked by a Frenchman, Julien Dubuque, who settled among and made friends with the Sacs and Foxes in 1774, just prior to the Revolution. The Indians in 1788 granted to Dubuque the mine he had discovered, known as Prairie du Chien, and in 1796 the grant was confirmed by Baron de Carondelet, the French governor-general of Louisiana. Dubuque worked his mines until his death, in 1809, when the Indians reclaimed them from Dubuque's creditors, and held possession until their removal from the district, in 1832, by the United States government. Dubuque's heirs then claimed the property, but the government ejected them; and legal squabbles kept the status of the district in a most uncertain condition until 1847. The mine La Motte, upon the head waters of the St. Francis River, was also discovered by a Frenchman. the famous adventurer and explorer, M. de la Motte-Cadillac, who founded Detroit. La Motte discovered the celebrated Golden Vein sometime between 1715 and 1719. The lead fields near Potosi, Mo., were discovered about 1720 by Philippe François Renault, and in 1763 the extensive fields known as Mine à Burton were discovered by Francis Burton, who in 1798 granted about one third of his claim to Moses Austin. The latter erected improved furnaces for smelting, sunk the first shaft ever seen in a lead mine in that district, and began the manufacture of shot and sheet-lead.

At the birth of the United States, France and Spain, with their respective territories of Louisiana and Florida, had jurisdiction over nearly all the valuable mining lands of the lead region; and even where the United States had acquired rights, the mining privileges were usually in the hands of the French and Indians, who recognized their value and were slow to part with them. The Indians, in particular, made the rich surface sheets of galena a source of continual profit. Their methods of smelting were crude in the extreme, consisting usually of a small hole dug in the ground and lined with rocks. This was usually located on a side-hill, both for the purpose of getting a strong air-draft, and also in order that a small tunnel connecting with the bottom of the furnace-hole might be dug, through which the molten lead could run off when the galena and fuel were thrown in and fired. Rough pigs, run in a hollow of the earth itself, and weighing about 75 pounds, were usually made by the Indian squaws and taken to the trading-posts for barter. This method of smelting was wasteful, but with the practically unlimited supply it made little difference, and almost any man who found either a pocket of the «float» mineral or a small vein could mine and smelt it roughly himself. As the surface deposits became exhausted, and the miners had to go deeper, while at the same time improved and economical methods of reducing the ore became necessary, more capital was required and the works became more extensive. There is probably no ore that reduces more readily than galena, yet at the same time the volatility of the molten lead permits great loss from careless methods. The composition of the ore, which is a sulphide, is about eighty per cent of lead, with more or less silver, and sometimes nickel, cobalt, or antimony, with about seventeen per cent of sulphur. Simple roasting suffices for its reduction, the sulphur combining at a low temperature with the oxygen of the air, and passing off. This is, in its simplest statement, the process by which lead is extracted from this ore; and either open furnaces with strong draft, or reverberatory furnaces, are used. Unfortunately a considerable quantity of the lead passes off in fumes from the furnace. In remedying this, some of the modern smelting-works have found it profitable to build a very long funnel-pipe, through which the fumes from the furnace are passed before they reach the air. During this passage they are cooled, and a very appreciable quantity of lead in the form of powder is deposited along the pipe.

In 1838 cerussite, or lead carbonate, was found by the American miners to be reducible and a valuable ore. This ore, previously thrown away by the miners, who called it «dry bone,» was found in large quantities, and its utilization very greatly increased the annual output during the decade following. Under this stimulus, and the litigation over the more important lead regions having been settled, the output of the mines in the Galena district jumped from 664,530 pounds in 1825 to 54,494,856 pounds in 1845. The decade between 1840 and 1850 witnessed the high-water mark of the lead interests in America up to the time that the Western lead fields were opened. The rich properties of the Mississippi and in Missouri yielded plenteously, and in their eagerness the mine owners allowed themselves to glut the market, so that prices fell and the entire lead industry received a set-back from which it was some years in recovering. The Jasper County lead fields, which have built up the town of Joplin, Mo., were discovered in 1848. Operations were carried on in a small way, but no general attention was attracted to this district until a dozen years later, when in three years 17,500 tons were produced from these mines. Since then the annual output has been as great as 17,765 tons, and in one year (1884), the disastrous one for all lead interests, as little as 2,665 tons. American lead mines held a poor third place among the productive fields of the world, however, until well into the 70's, ranking below England and Spain. But the development of the great Western deposits of argentiferous galena, discovered in 1864, changed all this. This rich region, neglected on account of its inaccessibility to a market, suddenly took on life and activity with the extension of the railroads through the territory. In 1877 the Eureka district was turning out nearly 20,000 tons of lead annually; the Utah lead fields, worked by the Mormons, were producing 15,000 tons annually so early as 1873, and by 1877 the output had increased to 27,000 tons for the year. Colorado was a year later in showing respectable results for her workings, but by 1883 the output of the mines of that State amounted to the tremendous total of 70,557 tons. This marvelous increase was largely due to the cerusite deposits at Leadville, which were first worked in 1878, and from which fully one half of the total lead production of the State was derived. These Western lead ores were, almost without exception, very rich in silver. While silver in small quantities is found in all galena, and has been extracted even from the ores of the Mississippi and Missouri lead regions in quantity ranging from 6 to 20 ounces per ton, it was only in the Western mines that the precious metal was found in quantity sufficient to make the lead a by-product so far as relative values were considered. So little was thought of lead, in fact, that in the earlier days, when transportation was more difficult and expensive, the ore was cupeled at the mines, and only the silver brought to market. For this reason the lead output was dependent upon the silver market, but this is beginning to change, so that the production of the American mines has been developed to a point far in excess of the figures of 25 years ago. The year following the development of the Western argentiferous deposits the United States was producing as great a quantity as was England in 1872, when she was the great lead miner of the world. Less than ten years later the annual output of the American mines had reached a figure greater than the combined production of England, Spain, and the United States in 1872, and the increase was steadily maintained.

In the foreign commerce of the nation lead has, within the past five years, come to play a far more important part than it ever did before. In 1885 the imports of lead and its manufactures were only $486,436, and the exports $123,466. In 1890 the figures had only increased to $657,658 for the imports and $182,412 for the exports; but the very next year saw a marvelous advance, which has continued ever since. The importation of silver-bearing ores, containing much lead, has also become an important matter, and until the silver repeal bill was passed, and the "bull" days for that metal ceased, Mexico had a great interest in that direction.

During the years between 1825 and 1899 the production of the lead mines of this country amounted to nearly 5,000,000 tons. The product, as summarized for the same period by the demi-decades, will give, if the previous explanation of causes is borne in mind, the best illustration of conditions, rise, and progress in the lead industry that can be drawn. Up to 1873 lead was almost entirely obtained from the non-argentiferous ores of the Missouri and Mississippi regions; but after 1875 the table specifies the relative quantities from the two grades of ore. The figures given are standard short tons:

PRODUCTION OF LEAD, 1825 TO 1899.

YEAR	Total	Non-Argentiferous Ore	Argentiferous Ore
1825	....	1,500	....
1830	....	8,000	....
1835	....	13,000	....
1840	....	17,000	....
1845	....	30,000	....
1850	....	22,000	....
1855	....	15,800	....
1860	....	15,600	....
1865	....	14,700	....
1870	....	17,830	....
1875	59,640	24,731	34,909
1880	97,825	27,690	70,135
1885	129,412	21,975	107,437
1890	161,754	31,351	130,403
1895	241,882	39,890	201,992
1899	304,392	40,566	263,826

In the production of the 304,392 tons of metallic lead in 1899 the 39 smelting and refining works employed 8,379 men, to whom was paid in wages for the year $5,088,684. This sum, together with $144,195,163 paid out for ores, supplies and materials, and other charges incidental to the carrying on of the business, brought the total expenditures for the year above $150,000.00. The value of product for the census year was $175,466,304.

Between lead crude, and cast or hammered into some required form, and lead manufactured, chemically changed, and metamorphosed, there is a great break in time. The chief of all the products of lead manufacture is, of course, the carbonate, which was the psmithium of the Greeks, the cerusa of the Romans, and is the white lead of to-day. As a pigment and base for colors it finds its chiefest use, its well-known body and opacity and ready assimilation with linseed-oil, which is the best of all vehicles for coloring-matters, making it the best substance man has yet discovered for this purpose. Other important lead products are litharge, the yellow protoxide; minium or red lead, which is a combination of the protoxide with a peroxide; orange mine or orange mineral, made by heating white lead; and lead acetate or sugar of lead. There are several other forms in which lead combines, but the substances already given are those of most importance in the arts. In point of antiquity the oxides seem to be older than the white lead, no traces of which are found in the wall-paints of the Egyptians, Hindus, or other ancient peoples; whereas the oxides are found to have been used both for the glazing of pottery and in colors. White lead was first brought into extended use by the Romans; and Rhodes, the manufacturing centre of antiquity, was the place from which the finest was obtained. Roman women used the ceruse as a cosmetic — a use it also found among the Athenian belles; and minium was used as rouge. In these peculiar uses, despite the well-known injurious qualities of lead, the same substances have remained up to a comparatively recent date. White lead was also used by the Romans as a body for their paints, and both it and its manufacture are described by such ancient writers as Theophrastus, about 300 B.C.; Vitruvius, who wrote about 200 years later; and Pliny and Dioscorides, who filled respectively the records of the two succeeding centuries. These writers all agree in stating that white lead was produced by placing sheets of lead in pots with vinegar or wine lees, and allowing them to stand. This fails to account for the presence of the carbon dioxide necessary to the reaction which converts the lead acetate to the carbonate; but it is certain that this substance was present, for the product was unquestionably white lead. During the Dark Ages, and up so far as the 16th century, there was little use for white lead. About the latter date its manufacture was begun in Holland by what is now known as the "Dutch process." This process, however, can scarcely have been original with the Dutch, since Theophilus, a monk who wrote in the 10th century, describes it very exactly, and the Saracens, Italians, and Spaniards are all said to have used it. With the addition of stable litter banked around the jars, in which small bits of marble are also placed, the Dutch process differs in no way from that described by Pliny, who says: 'The lead is thrown into jars filled with vinegar, which are kept closed for ten days; the sort of mold which forms upon the surface is then scraped off, and the lead is again put into the vinegar until the whole of the metal is consumed.' The Dutch process has been the one which has proved the best and most profitable. Holland became skilled in this manufacture, and it was also widely used in England. America, on the other hand, had not one establishment for the manufacture of white lead at the close of the 18th century, what white lead was used coming from England; but the primitive habits of the community in those early days caused paint to be regarded not only as a luxury, but, furthermore, as a useless one, since timber was far too plentiful and cheap to require preservation at the expense of paint. After the Revolution more luxurious customs came in, and the use of paint became general in the cities. For the body of this paint all the white lead had to be imported from England. The English product at this time was heavily adulterated, and prices were more than high. So great did the demand become, and so profitable the business to the English manufacturers, that when the manufacture of white lead was proposed and commenced in the United States, the most desperate attempt was made to ruin the new American industry. Had it not been for the War of 1812 and the consequent shutting out of British goods, it is highly probable that the white lead industry would have been delayed for many years in this hemisphere. The original manufacturer of white lead in the United States was Samuel Wetherill, of Philadelphia, who began the manufacture of white lead early in the 19th century, probably about 1804. A night or two after the factory opened, it was destroyed by fire. About 1809 the factory was rebuilt, and then began the bitterest struggle any two great commercial interests here and in England ever waged. British lead was put on the market at a price that was absolutely impossible for the American maker to quote. The War of 1812 saved Wetherill from ruin, and under the impetus thus given the industry grew rapidly for a few years, its growth being still further aided by the development of the recently acquired lead regions that Louisiana included. By the census of 1810, Wetherill's factory, the only one in the country, was credited with an annual product of 369 tons. Red lead was also produced in small quantities, but the imports of these two products exceeded the domestic production as two and one half to one. In Philadelphia, where the industry began, the second factory in the country was started by John Harrison, at the Kensington works, about 1810. In the latter year the manufacture of white lead was begun at Pittsburg by Adam Bielin and J. J. Stevenson. Meantime an Englishman named Smith appeared in Philadelphia as a manufacturer of white lead, and all five of these firms were struggling against the English manufacturer when the War of 1812 came to their relief. All these early manufacturers employed, so far as can be learned, the Dutch process. Certain patents for improvements upon it were taken; but the burning of the Patent Office has destroyed all record of them, except that Samuel Wetherill devised and secured a new and better method «for setting the beds or stacks.» Stable litter as the source of the required heat was in universal use. In 1814, Welch & Evans, of Philadelphia, patented a method by which granulated lead, placed in revolving lead-lined barrels partly filled with water, was ground by attrition, oxidized by the air, and carbonized by the addition of burning charcoal. A factory for the manufacture of lead by this process was built soon after by a Mr. Richards, who had succeeded the Englishman Smith, but the venture proved unprofitable. The price of white lead before the War of 1812 was 10 to 20 cents a pound. American manufacturers mainly used the imported pig-lead, and the domestic supply was small. When the importation of the foreign pig-lead was suspended by the war, the price of the native metal took a great jump. A great scarcity of the metal resulted, and the price of white lead advanced to 30 cents a pound. This profit, together with the general resumption of business that came after peace was declared, gave a fresh impetus to the white lead industry. Many new works were established, and older ones extended, so that by 1830 there were 12 establishments in the country, of which 8 were east of the Alleghanies. These factories were not turning out over 3,000 tons annually, and as the price of white lead, following a temporary glut of the pig-lead market, had declined to 9 cents per pound, the total value of the year's output was but a little over $500,000. About two years after this Augustus Graham, a prominent New York manufacturer of white lead, discovered, by obtaining employment as a common workman in one of the great English factories, the secret of the use of spent tan-bark instead of stable litter as a means of obtaining heat and carbonization. This knowledge worked a considerable change in white lead manufacture, and by 1840 the annual product had increased about two thirds in the whole country. Prices, however, had advanced little, white lead being quoted at only a cent a pound more than in 1830. The sudden bursting forth into prosperity and productivity of the mines in the Galena and Missouri lead regions, during the fifth decade, had an immediate effect upon the white lead industry. The supply was unlimited, but the question of transportation was a serious one. Waterways were the only freight routes available, and Europe was far nearer to the Eastern cities than those towns situated to the westward of the great bar of the Alleghanies. From the Missouri lead fields, and the Galena region as well, the pig-metal was boated down to New Orleans, and there transshipped by vessel to New York. It was a long journey, and a costly one; and in some sections, not readily within the distributive field of New York or the large coast cities, other means were adopted. Sometimes it was carried in prairie schooners from the mines to Milwaukee, where the lead was shipped in sailing vessels to Buffalo. The years 1850 to 1865 marked no important advance in the lead industry. The introduction of the manufactured zinc oxide as a substitute for white lead, together with the advance in the price of metallic lead under the strong influence of the war-time demand, checked the use of the manufactured product until the return of better times at the conclusion of the war. Furthermore, adulteration, which had long been regarded as permissible by white lead makers, came to the condemnation it deserved, and the purer product developed by this sentiment had its immediate effect in raising the manufactured lead in the public estimation. «Sublimed lead» came to be introduced for use as a substitute for white lead. Its discovery resulted from certain unsuccessful experiments made by Lewis and Bartlett to discover an improved and speedier process for manufacturing white lead. On the whole there has been no improvement on the Dutch method.

The lead oxides, of which a considerable quantity is annually produced in the United States, were, like white lead, first manufactured in the western hemisphere at Philadelphia, where, before the War of 1812, there were at least three establishments. Their manufacture has changed little during 200 years. In making red lead, which is, perhaps, the most important of the oxides, the method is simply to heat litharge in a reverberatory furnace, which immediately changes it from yellow to red. In this country this method is the one commonly employed, although some works substitute a bottle-shaped iron cylinder for the reverberatory furnace. Red lead and litharge are usually manufactured at the white lead works, and there are but few separate establishments for the exclusive manufacture of the lead oxides. Orange mineral, a form of lead oxide produced by heating white lead, is another of the useful products of the metal; and the valuable astringent known in medicine as sugar of lead, and chemically as acetate of lead, being obtained by the simple treatment of lead with acetic acid, and without the presence of carbon dioxide, is still another product well known to the commerce of to-day.

The personnel of the white lead industry since its establishment in 1804 has been an interesting one. Outside of those firms already mentioned, only two were established during the second decade, the Cincinnati Manufacturing Company in 1815, and Barney McLennon's works, in the same city, in 1820. Dr. Vanderberg, of Albany, in 1830, together with David Leavitt and John and Augustus Graham, under the title of the Brooklyn White-Lead Works, was operating successfully. Another Brooklyn firm of early establishment was the Union White-Lead Company, started by the Messrs. Cornell about 1827. The Salem Lead Company in 1824, and Francis Peabody in 1826, established the white lead industry in Salem, and Robert McCandless and Richard Conkling established works in Cincinnati during this same decade. During the next decade there were started the Boston Lead Company, in 1831; Great Falls Manufacturing Company, in 1832; Jewett Sons & Company, at Saugerties, in 1838; Gregg & Hagner, at Pittsburg, in 1837; and Reed & Hoffman, at St. Louis, in 1837. This last establishment afterward became the Collier White-Lead and Oil Company. From 1840 to 1850 was a period of rapid growth. Among the larger works established were the Atlantic White-Lead Company, of New York, founded by Mr. Robert Colgate; John Jewett & Sons' Staten Island works; the Great Falls Manufacturing Company, changed by Batelle & Renwick to the Ulster White-Lead Company; Suffolk Lead Works and Norfolk Lead Company, of Boston; the Forest River Lead Company, of Salem, successors to Francis Peabody; Thompson & Company, of Buffalo; B. A. Fahnestock & Company, of Pittsburg; Eagle White-Lead Works, at Cincinnati; and William Glasgow, Jr.'s, works, at St. Louis.

The succeeding decade saw less increase. William Wood and T. J. McCoy took the Eagle Works, of Cincinnati; the Niagara White-Lead Company started at Buffalo, and Wilson, Waters & Company at Louisville. This was but a lull, however, that was to give place to renewed activity. From 1860 to 1870 there were founded such great establishments as the St. Louis Lead and Oil Company, which succeeded the O'Fallon White-Lead and Oil Company in 1865; the Southern White-Lead Company, established by Platt & Thornburg in the same year; Goshorn Brothers, who secured the McCandless establishment in Cincinnati, and afterward organized it as the Anchor White-Lead Company; the Eagle White-Lead Company, also of Cincinnati; the Shipman White-Lead Company, organized at Chicago by D. B. Shipman; J. H. Morley's works at Cleveland; Haslett, Leonard & Company, who succeeded Waters in Louisville; Lewis & Schoonmaker, of Louisville, who later sold out to T. J. McCoy and the American White-Lead Company; the Western White-Lead Company, in Philadelphia; the Cornell Lead Company, which succeeded the Niagara Company, at Buffalo; Hall, Bradley & Company, of New York and Brooklyn; the Salem Lead Company, a new company organized by Mr. Francis Brown at Salem; and the Maryland White-Lead Company, which was established in Baltimore in 1867. Since this period there have been comparatively few large establishments founded. Even in 1870 the tendency toward consolidation was noticeable, and the two largest plants founded during the succeeding decade were absorbed by older companies.

The manufacture of white lead in former years had been very profitable. Such severe competition was the result that many factories became unprofitable. In order to lessen this competition various devices of association were successively tried, and in 1889 H. H. Rogers and the late Charles M. Pratt, who both had had large experience in the lead and paint business, attempted an organization patterned after the Standard Oil Company. After a period of ill-success arrangements were made by which other great factories of the country, the John T. Lewis & Brothers Company, Philadelphia, the Salem Company, of Boston, the Atlantic Company, of Brooklyn, and the Collier and Southern Companies, of St. Louis, were acquired. The writer then became president, and acquired the important works of Armstrong, McKelvy & Company and the Davis-Chambers Company, at Pittsburg. By the end of that year the National Lead Trust manufactured 80 per cent of the country's production of white lead, 70 per cent of red lead, 15 per cent of linseed-oil, 10 per cent of sheet-lead, 9 per cent of lead pipe, and 60 per cent of lead acetate, together with sundry other of the important manufactures of lead. Many small factories operating in a desultory way, with frequent stoppages, were closed for good; works in favorable localities, and capable of producing the best results in any one direction, were devoted to this branch, enlarged and improved, and the best class of employees selected and taken to the more important works. New machinery and more healthful appliances were at once put into use. Schools for mutual education among the more important manufacturers were organized, and the expert knowledge of each placed at the service of all. Efforts to reduce the unwieldy capitalization culminated successfully in 1891, when the Lead Trust was dissolved, and a new company, organized under the laws of the State of New Jersey, with a capital of $15,000,000 preferred and $15,000,000 common stock, took its place. The National Lead Company enjoys the unique position of never having borrowed a dollar. Every department is well managed, and the character of all manufactured products marvelously improved and placed upon the market at prices lower than ever before known.

W. P. Thompson,
President National Lead Company.

Lead-pencils. Lead-pencil manufacture in the United States did not begin until 1860, but in 1903 there is estimated to be $4,000,000 capital invested in the industry, and American lead-pencils are sold all over the world. This country is particularly adapted to the production, for it has rich graphite mines, and extraordinary facilities, also, for obtaining this substance from elsewhere; it also has the only great forests of cedar in the world, from which the stock of the pencil is made, and even sends quantities of cedar to foreign pencil makers. Above all, it has had numbers of ingenious mechanics to originate labor-saving machinery. Germany is the pioneer country in lead-pencil manufacture, and from that nation came many of the founders of the industry in the United States. Among the first in this country were Eberhard Faber, Joseph Reckendorfer, and Henry Baulzheimer. New York city and vicinity have always been the seat of lead-pencil manufacture in this country, and among the prominent manufacturing firms now located there are the American Lead-Pencil Company, the Eagle Pencil Company, and the works and office of Eberhard Faber; while in Jersey City is the plant of the Joseph Dixon Crucible Company, founded by Joseph Dixon at Salem, Mass., as early as 1826, and moved to Jersey City in 1840. The company did not begin to make lead-pencils until 1872. It is the pioneer graphite company in the United States, if not in the world. The plumbago crucibles (which are identical with graphite) were invented by Joseph Dixon. Graphite now enters largely into every department of the mechanical arts. The American output of pencils is calculated to be 5,000 gross daily. American lead-pencils now supply nearly all the home demand and are sold everywhere. Many novelties in pencils have originated in the United States.

Lead-poisoning. See Lead.

Leading Star. See Lodestar.

Leadville, lĕd'vĭl, Colo., a city and the county-seat of Lake County, 80 miles by rail southwest of Denver, the State capital, on the Colorado M., Colorado & S., and the Denver & R. G. R.R.'s. It is situated 10,200 feet above the sea amid picturesque scenery, near the headwaters of the Arkansas River in central Colorado, between the Mosquito and Sawatch ranges of the Rocky Mountains. Leadville was first settled in 1860 by miners and prospectors, but after a period of comparative prosperity as a gold-mining centre declined with the exhaustion of the first discovered deposits. It revived with the discovery of 1877 of rich lead and silver deposits, followed by the discovery of other gold, zinc, copper, bismuth, and manganese deposits, and is now one of the most important localities in the world for the mining and reduction of the ores of the precious metals, some of the mines being 700 feet deep. Leadville's annual production of metals amounts to $10,000,000. It is the mining, farming, and grazing trade centre of an extensive region, has fine buildings, including a Carnegie library, opera house, theatre, court-house, jail, hospital, and almshouse, has a parochial school, a high school and four grade schools, two Roman Catholic churches, two Methodist, two Presbyterian, a Baptist, a Congregational, and a Lutheran, is lighted by gas and electricity, has an excellent water supply, and well organized fire and police departments. Besides its large sampling, refining and reduction works, smelting furnaces, etc., its mines employing 4,000 workmen, its smelting 1,200, and incidental to mining and smelting 1,200; it has also iron foundries, manufactures of machinery, ice, jewelry and novelties, and a government fish-hatchery. There are two National banks, the volume of business of the Carbonate National bank in 1902–3 being, receipts $24,071,492 and disbursements $24,095,624. The city is administered by a mayor and common council of six members elected biennially. The population, consisting of Americans, Irish, Swedes, Finns, Austrians, Italians, Germans, Cornish, and English, was (1890) 10,384; (1900) 12,455.

Henry C. Buller,
Editor of ‹Herald Democrat.›

Leaf-beetle, a popular name for many members of the family *Chrysomelidæ* (q.v.), which embraces about 18,000 widely distributed species, about 600 of which are found in North America. The larvæ, which feed upon the succulent parts, either fully exposed, in protective cases, beneath the epidermis as leaf-miners or stalk-borers, are all soft-bodied six-footed creatures with great appetites. Some larvæ feed on roots, some are aquatic, and many cover themselves with excrement as a protection against their enemies. The adults of several tropical species are of such brilliant colors as to be used for jewelry when mounted in gold settings. The family includes many species considered serious pests of cultivated plants. Some of the most noted of these are the flea-beetles, tortoise-beetles, potato and asparagus beetles, elm-leaf beetle and the diabroticas, represented by the striped, and the spotted cucumber-beetle. These are treated under their food-plant titles.

Leaf-bug, or **Plant-bug,** bugs of the family *Capsidæ,* which suck the juices of plants. Two hundred and fifty of the thousand or more species described occur in the United States, and all except the predaceous species are vegetable feeders, a few being considered pests. They are generally oval or elongated, yellowish or greenish, sometimes with lines or dots of red or black. All have a decidedly «buggy» odor. Among the best known species are the red-bug or cotton-stainer (*Dysdercus suturellus*), so called because its excrement stains the cotton in the opening boll, thus reducing the grade. It is less troublesome than formerly because the piles of cottonseed in which it used to breed are now used for oil instead of being thrown in heaps to decay. The insect also attacks oranges in Florida. Cottonseed will attract them away from the trees. Another species troublesome on currants, gooseberries, dahlias, etc., is the four-lined leaf-bug (*Pœcilocapsus lineatus*). Its eggs are laid in the young twigs which may be cut in autumn or winter and burned. The insects may also be jarred off the plants into receptacles while sluggish in the early morning.

Leaf-cutter Bee, one of the large bees of the genus *Megachile,* of which a common species in the United States is *M. cetuncularis.* It is a «thick-bodied bee with a large square head, stout scissors-like jaws, and with a thick mass of dense hairs on the under side of the tail for the purpose of carrying pollen.» These bees make their nests in the hollow stems of elder-bushes, or, nowadays, often in crevices about buildings, and form their cells of round pieces which they cut out of tender leaves of many sorts of trees and bushes, especially the rose. Many cells are made, each containing an egg and store of pollen, and the whole economy of the group is very interesting. There are many species in various parts of the world. Consult: Packard, ‹Guide to the Study of Insects› (1889).

Leaf-cutting Ants. See Ants.

Leaf-hopper, any member of the family *Jassidæ,* which includes a very large number of small bugs greatly varying in form and often grotesque. They are especially numerous in grass and grain, which they are believed to injure to a greater extent than is usually supposed. Among the best-known species is the grape-vine leaf-hopper (*Erythroneura vitis*), which is often so abundant in vineyards that the leaves may turn brown from the insects' punctures. They have been effectively caught by tapping the vines to make the insects jump against a screen smeared with tar or a fan similarly covered and kept in constant motion close to the vines. This species is sometimes erroneously called «thrips» (q.v.). Among the best known of the grass-feeding host of species is the destructive leaf-hopper (*Cicadula* or *Limotettix exitosa*). This is sometimes caught in wide pans covered with tar and dragged across the field.

Leaf-insect, or **Walking Leaf,** tropical species of the family *Phasmidæ,* which is represented in temperate climates by the walking-stick (q.v.). They are so called because of the remarkable resemblance of their wings to leaves, not only in color but also in the arrangement of the veins, etc., so that the natives believe that the insects are really leaves which have acquired organs of locomotion, digestion, etc. Their legs also look more or less like twigs, and their eggs, which are dropped upon the ground from the foliage where the insects feed, look very much like seeds. This likeness is of use as a protection from enemies. See MIMICRY.

Leaf-miner, any insect of the superfamily *Tineoidea,* which comprises several families of very small moths, most of whose larvæ feed upon the soft tissues (parenchyma) of leaves and green stems beneath the epidermis, sometimes eating away rounded passages and sometimes long serpentine paths. More than 4,000 species have been described, of which fully 1,000 are American. The adults are often remarkably beautiful, exhibiting under the microscope a covering of lustrous scales. Among the plants that these insects attack injuriously are oaks, pines, maples, and palmettos. Some of the leaf-feeding species have developed the habit of feeding during their later larval days upon the outside of the leaf, either fully exposed or in a protective case. Others have assumed root- and seed-feeding habits; still others have become twig-borers, and gall-formers. Some of the related species live upon animal skins, fur, wool, etc. (See CLOTHES-MOTH.) A few flies of the families *Anthomyiidæ* and *Oscinidæ* are leaf-miners, as are also some leaf-beetles of the family *Hispini* and some sawflies of the family *Tenthredinidæ.* Consult: Comstock, 'Manual for the Study of Insects' (1895); Sharp, 'Cambridge Natural History,' Vol. VI. (1899).

Leaf-monkey, an Anglo-Indian name for a langur (q.v.).

Leaf-nosed Bats, a general term for such bats as have on the snout upright leaf-like growths of highly sensitive membrane which is presumably of great assistance to them in making their way about in darkness, and in finding and taking their insect-prey. (See BAT.) These folds of skin are, naturally enough, called the nose-leaf, and may be comparatively small and simple, or so large as to form a grotesque mask, such as gives so extraordinary appearance to the horse-shoe and other leaf-nosed bats of the family *Rhinolophidæ,* and to the «false vampires» of the family *Nycteridæ.* North American bats show very little of this peculiarity. These complicated membranes are always fringed with long fine hairs, which serve the purpose of the tactile whiskers of cats; and the bats possessing this feature are more thoroughly nocturnal than those in which it is lacking or little developed.

Leaf-roller, Leaf-tyer, or **Leaf-sewer,** a small moth, in most cases one of the family *Tortricidæ,* whose caterpillar rolls a leaf or a part of a leaf into a case, tying it into a cylindrical case with silken bands and lining this case with silk, so as to form a sort of cocoon in which it may transform safely into the pupa stage. In some cases the nest is formed by fastening together several leaves. «In most cases,» says Comstock, «the building of the nest is the work of a single larva, but in very many instances several larvæ work to build a common nest.» Each species makes its nest of a particular form, and infests some special kind of plant or tree; and many do considerable injury, especially among greenhouse plants and orchard trees.

Leaf-tyer. See LEAF-ROLLER.

League, lēg, a measure of length varying in different countries. The word is supposed to be of Celtic origin, but it has been introduced into the modern languages of Latin origin through the Latin *leuca.* The Roman league was equal to 1,500 paces, each of 5 feet. The English land league is 3 statute miles, and the nautical league 3 equatorial miles, or 3.457875 statute miles. The Italian league is reckoned as equal to 4 miles, each of 5,000 feet. The Spanish league varies very much according to the locality. On the modern Spanish roads the league is estimated at 8,000 *varas,* or 7,416 English yards. The Portuguese league is equal to 3.84 English miles. In the old French measures the length of the league was different in every district, but the three principal leagues were the legal or posting league, equal to rather less than 2½ English miles, the marine league somewhat more than 3½ English miles, and the astronomical league equal to about 2¾ English miles. The metric league is reckoned as equal to 4 kilomètres.

League, political connections which have been called *alliances* since the French language has become the diplomatic language of Europe. Among these are the League of Cambrai, formed in 1508 between Louis XII., king of France, the German emperor Maximilian, and Ferdinand of Spain, for the purpose of humbling the Republic of Venice, and which was joined in 1509 by Pope Julius II. This league was dissolved in 1510, as many similar ones have been, in consequence of mutual distrust, and was succeeded by the *liga santa,* or holy league, between the pope, Maximilian, Ferdinand, and Venice. The object of this was to compel Louis XII., whose allies had now become his enemies, to renounce his conquests in Italy; which object was gained. Thirty years afterward a holy league was formed in Germany. When the principal Protestant princes in Germany united in 1530, and again in greater numbers in 1536, to form the union of Schmalkalden, in order to protect their common faith and withstand the Emperor Charles V., the Roman Catholic princes assembled at Nuremberg, in 1538, to take measures for the support of their own faith, and to oppose the designs of the Protestant princes; and as their league had the protection of the Roman Catholic Church for its object, they termed it the *holy league*. A fourth league was headed by Henry, duke of Guise, in 1576, against Henry III. of France. Its ostensible object was the support of the Roman Catholic religion. There was a fifth league in Germany in the 17th century.

Leahy, lē'hĭ, **William Augustine,** American author: b. Boston 18 July 1867. He was graduated from Harvard in 1888, was literary editor of the Boston *Traveller* in 1893–4, then entered general literary work, and contributed verse and short stories to magazines. In 1902 he was appointed secretary to the music department of Boston. His works are: ‘The Siege of Syracuse’ (1889); ‘The Incendiary’ (1896), which obtained a prize offered by the Chicago *Record;* and a ‘History of the Catholic Church in New England’ (1899).

Leake, lēk, **William Martin,** English archæologist and topographer: b. London 14 Jan. 1777; d. Brighton 6 Jan. 1860. An officer in the West-Indian service (1794–8), and artillery instructor at Constantinople in early life, he later traveled in the East, and was engaged in surveys and diplomatic business for the British government in Greece (1805–9). Among his publications are: ‘Researches in Greece’ (1814); ‘Topography of Athens’ (1821: 2d ed. 1841), a learned and still valuable work; ‘Historical Outline of the Greek Revolution’ (1826); ‘Travels in Northern Greece’ (1835); ‘Peloponnesia’ (1846). Consult: Marsden, ‘Brief Memoir of the Life and Writings of W. M. Leake’ (1864).

Lean'der and Hero. See Hero.

Leaning Tower. See Pisa.

Leap Year, the name given in Great Britain to every year of 366 days. The length of the year is a little less than 365¼ days. Julius Cæsar, in reforming the calendar, arranged that in every fourth year February should have 29 days instead of 28, and that two days should be called by the same name. The day whose name was repeated was, according to the Roman method of reckoning, the sixth before the calends of March, that is, the 24th February, and the year in which this name was given to two successive days was named *bissextile* (*bis,* twice; *sextus,* sixth). The name leap year is perhaps due to the notion that the calendar takes a leap of one day every fourth year to make up for its ordinary year being one fourth day too short. Every year is a leap year which is divisible by four without remainder, except the concluding years of centuries, every fourth only of which is a leap year; thus the years 1800 and 1900 are not leap years, but 2000 and 2400 are.

Lear, lēr, **Edward,** English author and artist: b. London 12 May 1812; d. San Remo 29 Jan. 1888. In 1831 he became draftsman to the London Zoological Society. His illustrations of the ‘Family of the Psittacidæ’ (1832) was followed by many other illustrations for zoological works by Gould, Bell, Swainson, Jardine, and Gray. In 1837 he visited Italy and the East, and in those parts spent most of his remaining days, chiefly occupied with landscape painting. He exhibited ‘Dead Birds’ in 1836, and in 1850 was represented at the Royal Academy exhibition by ‘Claude Lorraine's House on the Tiber.’ As an author he is best known by his ‘Book of Nonsense’ (1846); ‘Nonsense Songs and Stories’ (1871); ‘More Nonsense Songs,’ etc. (1872); and ‘Laughable Lyrics’ (1877). He also wrote ‘Views in Rome and its Environs’ (1841); ‘Illustrated Excursions in Italy’ (1846); ‘Journal of a Landscape Painter in Greece and Albania’ (1851); ‘Journal of a Landscape Painter in Southern Calabria’ (1852); ‘Views in the Seven Ionian Islands’ (1863); and ‘Journal of a Landscape Painter in Corsica’ (1870). Tennyson's verses ‘To E. L. on his Travels in Greece’ were addressed to Lear.

Lear, Tobias, American diplomatist: b. Portsmouth, N. H., about 1760; d. Washington, D. C., 11 Oct. 1826. He was graduated at Harvard in 1783, and in 1785 became private secretary to General Washington, to whose domestic affairs he attended for several years, and by whom, in his will, Lear was most liberally remembered. In 1802 he was consul-general at San Domingo, and afterward consul-general at Algiers and commissioner to conclude a peace with Tripoli. He discharged this last duty in 1805 in a manner which gave offense in certain quarters, but his conduct was approved by the Federal government. He returned shortly after to the United States, and at the time of his death (by suicide), was employed in Washington as accountant of the War Department.

Lear. Shakespeare's great drama of ‘King Lear’ was written between 1603 and 1606. The bare historical outline of the story of the King he obtained probably from Holinshed or from an old play, the ‘Chronicle History of Leir’; the sad story of Gloster was found in Sir Philip Sidney's ‘Arcadia.’ The motifs of the drama are the wronging of children by parents and of parents by children.

Leary, Richard Phillips, American naval officer: b. Baltimore 3 Nov. 1842; d. Boston 27 Dec. 1901. He was graduated at the United States Naval Academy in 1860; served during the blockade of Charleston 1863–5; promoted commander in 1882. During the Samoan revolution in 1888 he was the senior naval officer present at the critical moment. He was promoted captain in April 1897; commanded the cruiser San Francisco in 1897–8; and when the New Orleans was purchased from Brazil convoyed that vessel to the United States. At the close of the Spanish-American war he was appointed the first American governor of Guam, and served there till relieved, on his own request, in April 1900.

Lease, Mary Elizabeth Clyens, American writer and speaker: b. Ridgway, Pa., 11 Sept. 1853. She was educated at Saint Elizabeth's Academy, Allegany, N. Y., and after graduating there removed to Kansas, where in 1885 she was admitted to the bar. In 1888, at a union labor convention, she made her first political speech, and in the campaign of 1890 delivered over 160 addresses in the interest of the Farmers' Alliance (q.v.) to the triumph of which that year in Kansas her effective efforts were believed to have largely contributed. She was afterward appointed president of the State Board of Charities, being the first woman chosen to such an office in this country. At the Columbian Exposition she was orator on Kansas day; represented Kansas at the National Conference of Charities and Corrections; and was national vice-president of the World's Peace Congress in Chicago, in 1893. She has written much for periodicals; is author of 'The Problem of Civilization Solved'; and has lectured frequently on literary, political, and economic subjects.

Lease, a species of contract granting the possession of lands, tenements, or incorporeal hereditaments, for life or a limited term of years, or during the pleasure of the contracting parties. The grantor is called the lessor and the grantee the lessee. A lease may be in writing or by parol, but the former is more satisfactory, as it usually sets out in regular form and binding terms the respective rights of the contracting parties. A lease contract establishes the relation of landlord and tenant between the lessor and lessee, unless its terms limit the relation of the parties. A lessor who holds an estate for years only may under-lease in such a manner as to establish a technical relation of landlord and tenant between the owner of the fee and the lessee. One of the essential requisites of a lease is, that its duration must be for a shorter period than the duration of the interest of the lessor in the property leased; for if the holder of an interest less than that of a fee leases his interest for the full term of its continuance it would be in effect an assignment or sale of his interest and in no sense a lease. In a lease proper, the lessor reserves to himself a reversionary interest in the property included in the lease. The beginning and termination of which are to be determined by the agreement of the parties. This agreement must also include a designation of the premises, estate or interest, intended to pass to the lessee. A term, however, is perfected only by the entry of the lessee. Even after the making of a lease the estate remains in the lessor up to such time as the lessee actually enters into possession, and the only right the lessee has in the estate is that of making an entry, which must be exercised to give him the additional rights provided for in the lease. All persons possessed of lands or tenements, or interest therein, competent to do business and under no legal disability, as of unsound mind, immature age, or the like, may enter into a lease contract.

Lease'hold. A leasehold is an estate held under or by virtue of a lease. An estate for years usually commences by means of a written lease. It is important to distinguish between a lease and an agreement to lease, the former being a completed contract and the latter only a stipulation for the formation of a contract at some future time. It is often difficult to determine to which of the two classes an instrument belongs, without resorting to an interpretation based upon the intentions of the contracting parties. If a lessee fails or refuses to enter into possession under and in accordance with the terms of a lease, the possession remains undisturbed in the lessor, and the remedy of the latter would be by an action for not entering into possession and for consequent damages, rather than for a breach of the conditions of the terms of the lease, the relation of landlord and tenant not having been established before an entry under the lease. A person can convey by lease no greater interest than he possesses in an estate. If the lessor has only a life estate it terminates with his death, although he may have executed a lease for a term of years not completed at the time of his death. The ordinary powers, duties and obligations of the contracting parties may be increased, diminished, or modified by special provisions in a lease. Many lease contracts provide for all of the contingencies which can ordinarily happen. It is not infrequent that a clause in the instrument provides that the lessee may build upon land leased to him, and that he shall have the right to remove his buildings at the expiration of his term, or purchase the fee. Any provision not illegal or inconsistent with public policy may be an incident of a leasehold.

Leather, Shoe, Manufacture of. The art of manufacturing raw hides into leather has been known for centuries, but only through many changes and improvements did the industry reach the perfect condition it has developed into at the present time. Until a half-century ago the leather turned out was at its best crude, and to-day would not be considered fit to be used. But since the introduction of machinery which simplified the process and reduced the time of tanning to from 90 to 120 days on sole-leather, and incidentally lessened the cost, better leather is being turned out; and each year brings torth some new invention that further perfects the process and reduces the time and expense. Until within about 20 years bark was relied upon as absolutely essential to manufacture good leather, but extracts were introduced which did away with bark in part, and to-day there are tanneries that manufacture leather by quebracho and other extracts entirely. There have been many adverse comments on the extract tanning, but it is the process of the future, and tanners who have no faith in it and predict failure should visit some of the tanneries where extract-tanned leather is made, and see what excellent results are produced in 45 days, or little more than half the time that tanners who do not use this process take to tan their hides into leather.

The chrome process is another great invention that simplified the art, and manufacturers are enabled to turn out better leather at less cost and in much less time than by the old process. The chrome process is now in general use in the manufacture of upper leathers, and with excellent results. It was only a short time since that the chrome tannage came into general use in the manufacture of patent leather for shoe purposes, and to-day it is used extensively, as it gives a better grain and a tougher and more pliable leather than was obtained under the old process. Tanners and chemists have for years been trying to tan leather, both upper and sole, quickly and cheaply, and all sorts of inventions have been tried, with the result that the time has been cut down considerably; and in recent experiments the tanning of leather was accomplished in about 30 days for heavy leather by the use of extract and the drum to tan the hides in — a saving of from 60 to 90 days. This is of great benefit to the tanner; it brings him much nearer the hide-market than when leather was only tanned in three to four months, and he is not compelled to take such long chances on the market.

Leather manufacturers are divided into two great classes; namely, the sole-leather tanners and those that manufacture upper leathers.

Each of these classes is variously subdivided, some making oak sole-leather, some union, and others hemlock. The upper-leather tanners are divided into patent-leather tanners, for shoe purposes, and for carriage and furniture use, glazed-kid tanners — glazed kid being commonly known as «vici kid,» from the fact that the first man to use the process whereby good glazed kid was manufactured called his stock «vici,» calfskins, etc. There is a difference in the process of tanning these different varieties, and various kinds of hides and skins are used; skins, for example, that are adaptable for the manufacture of glazed kid could not be used to manufacture calfskins; again, hides that are used for patent-leather purposes could not be used with any degree of success in tanning some kinds of sole-leather.

Sole-Leather.— This is made in three different kinds — hemlock, oak, and union. Hemlock sole-leather is divided into acid, non-acid, and slaughter acid. For the acid leather dry foreign and green hides are used, such as Bogotas, etc.; Central American, Orinoco, Buenos Ayres, Chinas, Buffaloes (hides that come from Calcutta), etc. For non-acid leather dry hides only are used. For acid slaughter leather green hides are used.

In the tanning of dry hides, they are first prepared by soaking, then they are milled, resoaked and sweated, unhaired, and unfleshed. When the hide has reached this stage it is ready to be put through the tanning process, and not before. The reason of this is that dry hides must be brought back to their original condition; that is, the same condition they were in when they were taken off the animal.

In acid leather, when the hide has reached the stage where it is ready for the tan-vats, that is, after it has been unhaired, it is first put into a vat for coloring with a weak tanning liquor, either sweet or sour, sweet giving a deeper grain than sour liquors; tanners use either as preferred. In order to plump it, the hide is then put into sulphuric acid for one day. This acid is about ¼ to ½ per cent in strength. The hide is then put through the different layers of liquor in the tannery, beginning with a low degree liquor, and gradually increasing through liquors of greater density, until the hide is tanned through and is now leather. After removal from the last liquor it is washed in a scrub-wheel, in order to remove any liquor that may remain in the hide, and is then bleached. The principal materials used in bleaching are sal-soda and sulphuric acid. From the bleach the leather is piled up for a day, in order to drain out the excess of water, and then given an application of cod or other oils on both the grain and flesh sides. The leather is then hung up in a loft to dry. After drying it is taken down and sprinkled with water upon the grain side, and laid away in boxes over night. The object is to assist in the better preparation of the leather for rolling, which is the next process it goes through. From the boxes the leather is rolled twice the same day, once in the morning and again in the afternoon. From the second rolling it is hung up in a warm loft to dry out perfectly before being shipped out of the tannery, ready for the market. From the time the hide leaves the liquor until finished the process is the same for all classes of sole-leather.

In non-acid hemlock leather the beam-house work is exactly the same as in acid leather until it goes into the coloring mill, they both being made out of dry hides, and the same process must be gone through to prepare them for tanning. When the hide has gone through the beam-house and been unhaired it is put directly into vats of weak liquors, and is plumped by being handled in a series of weak liquors for a period of 10 to 12 days. The rest of the process is the same as in the case of acid leather above. The liquors that the hides are put through in order to be tanned are made from bark and extracts. The principal extracts used are quebracho and hemlock, acid and non-acid leather being made from hemlock-bark and extracts, which give it the rich red color that distinguishes it from other tannages. Tanners use extracts in part (some use them altogether) for tanning, as they are cheaper than bark and produce better work. One ton of solid extract is equal to 10 tons of bark, and the advantages of using extracts are the shortening of the time of tanning, and the production of a better filled and firmer piece of leather, with a far brighter and lighter color.

Hemlock acid slaughter sole-leather is made from green hides. To prepare these for tanning, they are first soaked, then put into limes, and then fleshed. Some tanners reverse this method. Next, the hide is bated, that is, given a bath of lactic or acetic acid, to remove the lime; this is called «bating the hide.» The lime softens in this bath and dissolves the cells, so that the hair can be removed either by an unhairing-machine or on the beam by hand. From this part on most tanners plump in sulphuric acid, and carry on the process just as with acid leather. It takes from 90 to 120 days to tan hides into leather.

In making oak sole-leather only green hides are used, Colorado, Texas, and packer hides, etc. There is very little difference in tanning the various kinds of sole-leather, and the same formula that is used in tanning non-acid hemlock leather can be applied to oak sole-leather, with the exception that the hides must be limed, instead of being sweated, to remove the hair. Oak is a light-colored leather, and this color is got by using oak-bark, or oak-bark and extracts combined in the liquors, while the hides are going through the tanning process.

For making union sole-leather the same hides are used as for oak-leather — green hides — and as the name denotes, it is made by a union of hemlock and oak-bark; or in some cases oak-bark is done away with and extracts are substituted, the principal extracts used being chestnut wood and quebracho. The treatment gives a yellowish color by which it is readily distinguished from oak. The manufacturing process is exactly the same as in tanning oak-leather (see above).

Upper Leathers.— There are several different kinds of upper leathers made, but the principal ones are glazed kid, patent-leather, and calfskins. Glazed kid is made from dry goatskins, which are imported to this country, as but very few goats are raised here for their skins. In those foreign lands from which the greater number of skins come the industry of raising goats is made profitable, since not only is the skin used for tanning purposes, but the flesh is sold to the inhabitants for food. The skin is first soaked, and then milled, after which it is put into lime, in which it stays for a period of 12 to 14 days. It is then unhaired, principally to save the hair, which is sold, and the skin is put back into the lime. After the skin has been unhaired and properly limed, it is washed and fleshed, then it is pured, that is, the skin is cleaned in order to make it ready for the other process. The skin is now ready to be tanned, and is first given, for a few hours, a bath of bichromate of potash and muriatic acid, after which it is put into a drum overnight, in the same liquors. In the morning the skin is taken out of the drum and is «put-out» by a process of pressing out the liquor and flattening the grain. It is now given a second bath, this time in hyposulphite of soda and muriatic acid, which completes the tanning process.

After the skin has been thoroughly tanned it is washed to get the acid out, and is then «put-out» again before it goes into the drum to receive the stain or coloring matter. When the stain has been put on the skin it receives the fat liquor, which consists of soap and oil. This is done in order to give the skin life, as otherwise it would be too dry, and not strong enough to be useful for the purpose intended. After the skin has received the fat liquor it is pleated (doubled up with the grain out, and slicked to get the water out of the grain, and also to smooth out the grain). The skin is now ready for the coloring process, and is colored by dipping it in a color-box, the color being composed of logwood and copperas. Some tanners also use anilines to give the skin the black color. It is now washed by dipping it in water, and is then «struck-out» on the machine, a process which flattens out the grain and clears the skin of water. The skin is now taken and glycerined, and then oiled, after which it is hung up to dry. After the skin has been thoroughly dried it is kept a few days to season, and is then put into damp sawdust to moisten, as otherwise it could not be properly worked. The skin is then staked by the machine, for stretching and softening the skin, is then dried, and receives a perching, which consists of a light staking again. The skin is now ready to be seasoned, the principal ingredient of the seasoning matter being blood of cows, steers, bulls, etc. The skin is now again dried and ready to receive the first glazing, which is done by machine. After glazing, the skin is seasoned a second time, dried again, and receives a second glazing. It is seasoned for the third time, dried, and receives the finishing glaze. The skin is now ready for the market, and is measured and selected for quality and weight, when it is sold to the shoe manufacturer, who cuts it up into shoe-uppers, etc. The complete tanning process, from the time the skin is put into the first soak until it is ready for the market, takes from three to four weeks.

Another simple process of tanning goatskins of the cheaper variety is the one-bath chrome tannage, which combines low cost with good leather. The skin is first given a very thorough liming, in order to get the grain and fibre as soft as possible. After liming, the skin is bated thoroughly in manure-bait, in order to overcome as much as possible the roughness and coarseness of the grain. The grain is now thoroughly worked out, and the skin washed and put in pickle. The pickle is composed of salt, sulphuric acid, and water. So much water should be used that the skin can easily be stirred about in the pickle; during the first hour it is stirred continually, after which it may be allowed to rest for several hours with occasional stirrings. From the pickle the skin is then drained and is now ready for tanning.

For each 100 pounds of skins, a solution composed of eight gallons of water and one pound of Glauber's salt is put into the tanning-drum, the temperature of the solution being 90° F. The skin is then placed in the drum, which is run steadily for 15 minutes and then stopped, the skin thrown back on the pins, the plug pulled out, and the salt solution drained off. The plug is then replaced and about ten pounds of common salt and eight gallons of water to 100 pounds of skins is put into the drum. The skin is milled in this solution for about five minutes, and then there is added to the salt water and skin one gallon of one-bath chrome liquor for 100 pounds of skins, in which the skin is milled for half an hour, when another gallon of the liquor is added and the skin milled again, this time for an hour, when a third gallon of the liquor is added, and the drum is run steadily for two hours for skins of average thickness, and three hours for heavy and thick skins. At the end of this time the skin should be well tanned, but in order to complete the process and have the skin thoroughly tanned, it is necessary to add one half-pound of bicarbonate of soda dissolved in two quarts of warm water, and to have the skin milled for about three quarters of an hour. The skin is next removed from the liquor, allowed to drain for 24 hours, and then washed. For washing tanned leather, two pounds of borax is used for 100 pounds of skins. The skin is now washed for a few minutes in clear water and either struck out or pressed and shaved, after which it is ready for the coloring, fat-liquoring, drying-out, and finishing.

The introduction of patent and enameled leathers marked a notable step in this industry. The composition made by Seth Boyden more than 50 years ago induced leather manufacturers to prepare a leather for its acceptance. The first leather made was in oak and hemlock bark liquors. At that time the only known means of splitting hides was by the Union splitting-machine, operated by hand. The hide was partially tanned and then split on this machine, dividing it into three parts — the slab or leveler, used for shoe purposes such as insole stock; the next, known as a dash-split; and the upper part, called the hide or grain. The hide and the dash-split were then returned to the liquors and thoroughly tanned, after which the hide was taken by the currier and buffed on a beam in a wet state, as it was found to be impracticable to japan with the Boyden compositions on the natural grain. After the hide was buffed and the grain divided, the hide and the dash-split were taken to the «japannery» and coated in the following manner: The first coat, called «sweetmeats» by the mechanics, was made of raw linseed oil, to which, after boiling for 24 hours in heats varying from 400 to 550 degrees, umber and lampblack were added. After boiling, the mixture was cut with turpentine, so that the japanner could spread it on the surface of the hide with a steel slicker. When coated, the hide and split were placed in ovens operated with slides, and dried in heats running up to 160° F. After each coat was dried, the rough surface was ground off by using pumice-stone, and no less than two or three coats, according to the character of the leather, were applied. The leather was then in readiness for the finishing, or varnish coats. This varnish was made by boiling linseed oil in the same manner as the sweetmeats, and adding thereto chinese blue-lumps, in a proportion of about four ounces to the gallon of oil. The varnish, like the sweetmeats, was reduced with turpentine, and from 1 to 11 coats given the leather, according to the face and finish desired. After this was done the leather was taken from the ovens and exposed to the sunshine, which set the finish and the lustre. The leather was then taken off the frames, placed in a cooling-cellar, and left there from 24 to 48 hours, after which it was measured and ready for sale. In the manufacture of patent leather the use of turpentine for reducing compositions was not only dangerous, since combustion was probable, but also injurious, as it went to the brain of the operator, and often blood would run from the nose and ears as a result of congestion. A man japanning could not stand the fumes for over half an hour at a time. However, as time went on, turpentine was done away with and its place taken by naphtha, a product of petroleum, and to-day nine tenths of all shiny leathers are made with naphtha as a reducer of the compositions.

For years after the first patent leather was made, only what was known as hand-buffed could be produced, as the grain had to be cut off by the currier, on the beam, and the part taken off was useless. By this time, in the 70's, the Union machine had been improved to such an extent that the hide could be buffed on it, and instead of a part being thrown away, it was finished for pocketbook, bookbinding, and hat-sweat purposes, in all of which it took the place of roans and sheepskin skivers, and the hide from which it was taken was made into what was known as machine-buffed, patent, and enameled leather. Machine-buffed patent leather for carriage and other purposes has been sold for from eight to ten cents less per foot than the hand-buffed leather was and is now sold for. Later the manufacturers were enabled, with the advent of the endless-knife machine, to take off a lighter buffing than with the Union machine, and also to take off a heavier one if desired. This led to the use of the heavy buffing for shoe-tipping, and attracted the attention of the patent-leather men generally to the possibility of competing with France and Germany in the making of shiny leathers, not only for tipping, but for vamps as well. For many years this competition went on with indifferent success, until the chrome tannage was introduced, and the shoe-trade found that its application to all kinds of skins produced upper leather superior to the best bark and sumac tannage.

To the manufacturer of patent and enameled leather is largely due the cheap patent shoe-leathers that are in the market to-day, and which seem to have come to stay. Manufacturers experimented with the chrome process until they were enabled to split cow, steer, and horse hides successfully out of the limes, and then tan the grain in one-bath or two-bath chrome liquors. After they had accomplished this, they found that in order to enable them to make up their chrome-tanned grain into shiny leather for vamp purposes, that would last without cracking or opening, they would have to change from the old compositions and invent such as would enable them to finish the hide in the grain without buffing and with one varnish or finish coat, instead of from three to seven as before. Their success is known to the trade, and it is now in order to note the difference between the old and the new compositions, that of Seth Boyden and that in present use. To-day the most successful manufacturers are making their compositions as follows: The under-coats are made of a solution, the component parts of which are guncotton, amyl acetate, linseed-oil, Prussian blue, nigrosine, and other mineral colors. By the old process it took from 24 to 48 hours to soak the hide, and from eight to ten days to unhair and bate them. After that the hide was struck sufficiently through for sammying and splitting, which took 21 days. The splitting took in actual machine-work and preparation six days or so, and it required at least ten days more or retan the parts. The leather was then set out and dried on stretching-frames, after which it was softened, patched, and otherwise prepared for japanning, the whole of the latter process taking about ten days, according to the time it took to dry, which was never done by heat. In the japannery the hides were tacked on frames, and a day was allowed for each coat to dry, up to the time of the last varnish-coat, which was allowed a little more time. The sunning, stripping, and swelling ordinarily took about three days, making in all 72 days to finish hides into leather.

The manufacturing of leather by the chrome process, where manufacturers use the old method of unhairing and bating, would need as much time as in the old process, but the most successful manufacturers consume time in the production of their leather as here stated: Soaking and hairing require three days; killing the acid in this process, three days; all the fleshing and other beam-house work, done in the old process by hand, they now do by machinery; two days are allowed for preparing and splitting, and five days for tanning, coloring, fat-liquoring, and dripping; one day is then allowed for table-work, and four days for sammying, staking, and drying, after which the hide is put into sawdust for two days to moisten, then stretched and drystaked, for which two days are allowed; four days are given for japanning, after which the hide is put in the sun for part of one day, two days being allowed after this process for swelling; making in all 27 days — a saving of almost two thirds in time. Except the japanning, which is still done by hand, nearly all the work done under the old process by skilled labor is done under the new chrome tannage by machinery. It must be remembered, however, that when the manufacturer of the chrome upper-leather splits the hide, the split and slab do not generally go back to chrome, except where the manufacturer is able to produce from a chrome-tanned split an article of commercial value. He puts his split through the old bark-tannage process, in order to find a market for it, as he did before. A comparison of these two processes, and the material used, will show that the present cost of tanning, up to the japannery, is less than one half the cost of the old bark-tannage; but in the japanning, including the compositions used on chrome leather, the new process is nearly twice as costly as the old. See also HIDES AND LEATHER; TANNING.

J. GODDARD BROWN,
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Leather, Artificial. Owing to the demand for leather being in excess of the supply, many fabrics have been introduced with the intention, more or less successful, of supplying its place. An article of this sort known under the name of leather cloth, was first produced in America about 1849, and was brought well under the notice of the British public at the Exhibition of 1851. A textile fabric (generally unbleached cotton, calendered to make it smooth) is coated with linseed-oil, turpentine, lampblack, and other ingredients. It is then scraped with a knife to produce a uniform surface. It is afterward dried in a heated oven, and is passed between rollers covered with pumice dust to rub the composition smooth. These processes are repeated several times. Three or four coats of a sort of enamel paint are then applied. The grain of morocco leather is imitated by passing the cloth between grooved rollers; or patterns in relief may be obtained by passing it between embossing rollers. Another kind of artificial leather is made of leather parings and shavings reduced to a pulp, and then molded into buckets, machinery bands, picture-frames, and other useful and ornamental objects. Vegetable leather consists of caoutchouc dissolved in naphtha, spread upon a backing of linen. All odor of the naphtha is removed by a chemical process, and the fabric may be made of any thickness by additional backings of linen cemented with the caoutchouc. Its strength is almost marvelous, and it can be produced at about a third of the price of leather. It may be used for table-covers, carriage-aprons, soldiers' belts, harness, bookbinding, etc. It has several advantages over leather proper, among which we may mention, that however thin the imitation is, it requires considerable force to tear it; it is impervious to damp; moisture may remain long upon it without injuring it, and its polish is increased rather than decreased by friction. Various other substitutes of leather have been recently introduced, consisting of the application of oily pigments to cloth, or thin layers of leather attached to cloth, felt, or other backing by caoutchouc cement.

Leather, Chamois. What is known in the market as chamois skin is really an oil-tanned sheep or lamb skin lining. The supply of skins from the chamois animal is very limited; enough could not be obtained in a year to supply the United States for more than a single day. In Switzerland about five thousand to six thousand skins would be a fair average yearly crop. This skin is heavier than the skin of the sheep or lamb, also much coarser. For strength and durability this skin is preferable, but for ordinary use and appearance the oil-tanned sheep skin lining would, in most instances, be preferred.

To manufacture sheep or lamb skins into chamois leather the first step necessary is to remove the wool, which is accomplished either by painting the skin on the inside with a solution of sodium sulphide or by immersion in milk of lime. By the former method the wool is loosened in a few hours; by the latter method it will require several days. When the wool is loose, it is pulled off either by hand or scraped off with a dull instrument. The skin is now again immersed in milk of lime, to swell it. It is then cleaned (beamed, as the trade calls it), to remove all fleshy particles that may adhere to it. It is now ready for splitting. The chamois skin is really only the half of a skin. The outside, that is, that part of the skin next to the wool, known as the grain side, is not suitable for chamois leather, and is used for other purposes, mostly for hat linings, book covers, etc. In former times, when skins were prepared for oil tannage, this part of the skin was cut away with a suitable knife and thus lost. In our days the skin is cut through the centre (split), thus producing two skins from one — the outside, called grain or skiver, and the inside, called lining or flesher. The splitting is accomplished on machines specially constructed for this purpose. It consists of an endless knife, the edge of which is constantly grinding to keep it sharp, the skin being passed through rollers against the sharp edge of the knife. These machines require very delicate adjustment to produce good results.

The lining or flesher is now ready for tanning. This is accomplished by sprinkling it with oil, codfish oil of good quality. It is important that this oil should be thoroughly incorporated into the skin. For this purpose a quantity of the skins are placed into what are known as fulling stocks, which twist and turn the skins in every direction, and distribute the oil evenly. After sufficient milling the skins are partly dried and the process of sprinkling and drying is repeated again and again until they are full of oil, and all the moisture is dried out. They are now allowed to hang sufficiently long to thoroughly tan them at a temperature of about 100 degrees. The process after this is very simple. The oil is removed by pressure, and the balance washed out by saponification; after this they are dried and they are then ready for finishing. The oil, by the way, is recovered, by decomposing the soap solution with an acid and separating. It is sold to manufacturers of other leathers, it being useful to make them pliable, etc. The finishing is done mostly by pressing the skin against revolving wheels, covered with emery or flint to remove all adhering substances and to present a finished surface. We now have the finished chamois leather ready for the trimming and sorting room, where it is cut into suitable sizes and packed for the market. Of late years, a trimmed skin, that is, skins of even sizes, are preferred by the trade. For this reason most manufacturers, at least most American manufacturers, cut their skins over patterns so as to produce uniform sizes. In former years, when England and France supplied the United States market, the skins in the same package would vary in size and shape, thus lacking uniformity. See also HIDES AND LEATHER.

Leather-back, or **Leather-jacket.** See LEATHER-TURTLE.

Leather-beetle, one of the dermestid beetles (see DERMESTES), which in the grub state damages leather in storehouses and after it is made up into articles, such as shoes, harness, etc. The species is *Dermestes vulpinus;* and it is also a pest in silk manufacture, eating the cocoons. Infested places should be thoroughly fumigated with bisulphid of carbon, or some other powerful gas.

Leather-fish. See FILE-FISHES.

Leather-head, an Australian bird, the friar-bird (q.v.).

Leather Turtle, or **Trunkback,** a rare marine turtle of the tropical seas (*Sphargis coriacea*), which has a leathery case instead of a shell. It is the largest of existing *Chelonia,* known specimens having a case four feet in length, and a live-weight of not less than 1,000 pounds. When young its case is thin, soft and flexible, but as age advances the jacket becomes stiffened by the formation within it of great numbers of little adjoining bony plates; and the exterior shows strong longitudinal ridges. These turtles are powerful swimmers and wander throughout the oceans, feeding upon jellyfishes, crustaceans, cuttlefishes and other animal food. Late in the summer it seeks some sandy shore or islet, where the female buries her eggs after the manner of other sea-turtles. These eggs are good to eat, but the flesh of the animal is not of good taste, and is said to be unwholesome. Much interesting discourse upon the curious structure, relationships and ancestry of this declining race may be found in Gadow's ‹Amphibia and Reptiles› (London 1901).

Leatherstocking Tales, a name given a series of Indian and pioneer romances by James Fenimore Cooper (q.v.). The name Leatherstocking was given to Natty Bumppo, one of Cooper's heroes.

Leatherwood. See CYRILLA.

Leavenworth, lĕv'ĕn-wĕrth, **Elias Warner,** American lawyer: b. Canaan, N. Y., 1803; d. Syracuse, N. Y., 1887. He graduated at Yale College in 1824; studied law with William Cullen Bryant at Great Barrington, Conn., admitted to the bar in 1827, and began practice the same year at Syracuse, N. Y. He was secretary of state of New York, 1854–5; president Board of Quarantine Commissioners, 1860; 1875 to 1877 he was a member of Congress. He published ‹Genealogy of Leavenworth Family› (1873).

Leavenworth, Kan., the county-seat of Leavenworth County and one of the most important cities in the State, 26 miles northwest of Kansas City, on the west bank of the Missouri River, here spanned by two fine iron bridges, accommodating railway and ordinary traffic. The Missouri P., Union P., Atchison, T. & S. Fe, Kansas City N. W. and C. G. W. R.R.'s enter the city, which also is the eastern terminus of the Kansas Central Railway, and the Rock Island and Burlington systems. Leavenworth was founded by the «Sons of the South» in 1854, and the following year received a city charter. During the negro-emancipation agitation it was a strong pro-slavery centre. It derives its name from Fort Leavenworth north of the city, the oldest and most important military depot on the Missouri River, built in 1827. Leavenworth is the trade centre for a farming and coal-mining region, an inexhaustible coal deposit underlying the city at a depth of 700 feet, giving employment to over 1,000 miners, and yielding 60,000 bushels of coal daily. Besides its coal mines, the manufacturing industries are correspondingly extensive and include flour-mills, woolen-mills, iron foundries, manufactures of mill machinery, mine machinery, steam-engines, lumber, furniture, saddlery, brooms, baskets, buggies, wagons, shoes, patent medicines, bags, ice, crackers, candy, cycles, and dye-works.

The city, which is protected from inundation by a limestone stratum, is well laid out, electrically lighted, has an excellent water supply, and a complete system of electric street railroads, connecting with Fort Leavenworth on the north, and the National Soldiers' Home on the south. The principal buildings are the Catholic pro-cathedral of the Immaculate Conception, over 25 churches of all denominations, the Kansas State Orphan Asylum and protective home, Cushing and St. John's hospitals, two theatres, three national banks, two savings banks, etc. The educational institutions include Mount St. Mary's Academy, a high school, State normal school, and the Whittier library. The suburban Soldiers' Home accommodates 3,000 veterans of the Civil War, and is situated amid attractive grounds. A garrison of 12 companies of United States infantry and four troops of cavalry occupy Fort Leavenworth; the United States Infantry and Cavalry School for the instruction of army officers, and the United States military prison holding 800 prisoners are also situated here, and a mammoth bronze statue of Gen. U. S. Grant. The city is administered by a mayor and council elected biennially. Pop. (1890) 19,768; (1900) 20,735.

Leaves, in the ordinary sense of the word, are the structures on which devolves the duty of nourishing the plant. They invariably arise as lateral protuberances from the growing-points or terminal vegetative cones of the shoots, that is, from a part of the plant which is still in an embryonic condition. In cases where a leaf seems to arise from an older part of a plant, as from the trunk of a tree, close inspection shows that it is really developed from a shoot perhaps not readily visible. Its growth is first at the apex, but this soon ceases, and is followed by continuous enlargement throughout the tissues, by which the upper part or blade of the leaf is soon distinguished from the basal part, and the stalk or petiole (where present) is subsequently formed between them. The development may result in a variety of structures, some of which are far different from typical foliage-leaves, yet are strictly homologous; such are scale-leaves, bracts, and the parts of a blossom (floral leaves). The higher the rank of the plant in the scale of development the more these diversities are manifested; and the observations here to be made apply mainly to the phanerogams from the ferns (q.v.) upward.

Leaves collect from the atmosphere the great essential of plant-food, carbon, and conduct the processes of its assimilation, or, in other words, apply it by chemical conversion to the vitality and growth of the plant. In order to understand how they perform this function it will be necessary to investigate their structure and properties. Each leaf is composed of three parts, an outside layer on each surface of compact, flattened, and usually colorless cells, forming a skin or epidermis; an inner part (mesophyll) consisting of irregular cellular tissue and intercellular spaces. These cells of the mesophyll contain minute bodies (chloroplasts) of green coloring matter called chlorophyll, which also abounds in the bark of the stems of herbs and all other green parts of plants, and is the working element in their composition. Through the spongy mesophyll extends the network of veins which form the skeleton of the leaf, and are at once its support and its channels of communication with the other parts of the plant; these form the third part of the leaf. One other important feature must be mentioned — the breathing-pores, or stomata. These are excessively minute openings in the epidermis, which occur wherever chlorophyll lies underneath, but are most numerous on the under or earthward side of the leaves, where, on the average, about 60,000 may be counted per square inch of surface, although in some leaves they are six or eight times as numerous. Each of these pores lies between the «guard-cells» which form an automatic valve, opening or closing the pore, by their swelling or shrinking, according to varying conditions and the requirements of plant-health, especially in respect to evaporation. the chlorophyll grains (chloroplasts) also change their positions in the cells so as to take all possible advantages of a weak illumination, or to guard against a bad effect from excessive light.

Of the ten essential elements of plant-food nine are drawn from the soil by means of the roots, but the tenth, which is the most important and the largest in amount of all, is obtained by all green plants solely from the carbonic acid of the atmosphere, and is taken up by the green leaves alone; also a little of the oxygen required. The air enters the stomata, is seized, as it were, by the chlorophyll, and within it is so decomposed (in a manner not yet explained) that the carbon is chemically extracted and is transformed into plant-food and plant-substance, that is, is assimilated; and botanists restrict their use of the term «assimilation» to this physiological absorption of carbon alone. In order to be able to do this work, however, the leaves require the aid of sunlight, without which the chlorophyll becomes inactive, and in total darkness a green plant will speedily die of starvation, however rich may be the soil in which it is rooted. The «rest» of plants at night is thus accounted for; and also the greater rapidity of growth in northern plants where in summer they enjoy more hours of sunlight each day than southern plants get.

But the service of leaves in the nutrition of the plant does not cease here. They perform a most important function in the transpiration of water. Plants must always draw from the soil a quantity of water far in excess of their needs, or of their capacity to hold, in order to get a sufficient supply of the mineral food dissolved in it, but in exceedingly small quantities; and after that sustenance has been extracted the extra useless surplus of water must be got rid of. This is accomplished through the stomata of the leaves, out of which water is always passing in gaseous evaporation, or sometimes even in globules. A secondary, but most important accompaniment of this is the suction thus formed, by which the constant up-flow from the root-ends is maintained.

A third essential office of leaves is as the lungs of the plant, which must breathe in essentially the same manner and for the same purposes as does an animal; that is, they must take up oxygen and give off carbonic acid. This independent process (the converse of the simultaneous assimilation) is carried on steadily by all plants, night and day; but in those having leaves it is mainly performed by these organs, because they spread the greatest surface.

In addition to these foremost and general services, leaves are adapted in particular cases, almost as numerous as the plant species, to such special purposes as a depository of food for the young plant in the cotyledons or seed-leaves; as bulb-scales in plants like the hyacinth and lily, where part of the nourishment in the foliage of one year is stored up in the scales or subterranean thickened leaves, for the early growth and flowering of the next year; as bud-scales, forming the protective coverings of buds, as tendrils, pitchers, fly-traps, etc.

These complicated requirements and duties, under varied conditions and circumstances, have produced the extraordinary modifications of form and texture which leaves present, and which must now be briefly considered.

Forms and Arrangement of Leaves.— The typical and ordinary foliage leaf is a thin flat structure composed of stalk (petiole) and blade (lamina) of symmetrical form, and growing in the plane of the horizon, so that one side (the dorsal) is presented upward to the sky and sunshine, and the other (ventral) is downward and in shadow; and these sides usually present appropriate differences in texture, the upper surface being usually more smooth and compact than the lower. A great variety of textures, from smooth, polished or waxy, to rough, downy or spiny, are distinguished by botanists, and used in the description of plants; these variations of surface are largely defensive in their character. Some leaves have no stalk, and are said to be sessile, in which case the base of the leaf may partly clasp, or completely surround the stem, or be otherwise modified; similarly the stalk takes many forms, sometimes with two lesser subsidiary leaves (stipules) at the base. The rigid woody centre of the stalk may continue straight on through the middle of the leaf to its apex, forming a midrib which throws out branches alternately on each side toward the margin of the blade, each again branching repeatedly and connecting with its neighbor, and so forming a network or skeleton of woody fibres which strengthen and support the leaf. These ribs are called veins or nerves, and the whole is the «venation» of the leaf. Such a simple leaf (for example of the beech) is called reticulate or net-veined. In a large class of cases, however, the branches of the midrib do not spring at approximately equal intervals along its length, but all diverge from a point near its base, making a palmately veined arrangement, as in the maple. This reticulate veining is characteristic of dicotyledons. In another very distinct type of venation, characteristic of monocotyledons, there is no midrib, but the stalk divides at the base of the blade into many equal veins which extend in a more or less curving line through the length of the leaf, converging at the apex; such a leaf is said to be parallel-veined, as in grasses. Upon the plan of the skeleton depends mainly the form of the leaf, of which a great number of variations are named in botanical manuals and used in descriptions of species, depending mainly on the character and extent of the indentation or incisions.

The arrangement of leaves upon the plant is an important matter. That it follows certain regular plans is apparent in buds, which when cut across exhibit their young leaves packed together in one or another of certain definite ways; and their relative position on the stem of an herb or the twig of a tree follows as a result of the law of growth in that group. The theoretical perfection of arrangement, however, is often greatly disturbed by the interference of older leaves with the development of the younger, and by other causes affecting the unsymmetrical growth of the whole plant. The arrangement of leaves upon the stem, called *phyllotaxis,* is in most cases one of alternation, thus securing the uninterrupted exposure of the upper surface of the leaf to the sun. It is to obtain this exposure that plants struggle to become tall, and bear their leaves most profusely at the summit; and that the branches of trees reach outward as far as possible; and the lower early leaves of many soon die off because shaded by the later, higher growth. The arrangement is carried out in two principal ways: the leaves are either alternate, one after another, only a single leaf arising from each node or joint of the stem; or opposite, when there is a pair of leaves on each joint of the stem; but sometimes the leaves are whorled or verticillate, there being three or more in a circle on one joint of the stem. The result of this arrangement in an alternate-leaved stem is to cause the leaves to follow one another up the stem in a spiral manner; while any two successive leaves on the same species will also be separated from each other by just an equal portion of the circumference of the stem. The same principle governs the parts of the flower (q.v.) in which the sepals of the calyx typically alternate with the petals of the corolla, the petals with the stamens, and the stamens with the pistils, but it is often disguised in a very puzzling way, especially by the absence of one or more series of organs. See FLOWER.

Modifications of Leaves.— Leaves exist in other forms than the typical ones of foliage. Scales, such as those which envelop and protect buds in winter, and the seeds in cones, are leaves of simple structure which have no assimilative powers or functions; they most frequently originate from an enlarged leaf-base upon which a proper leaf never develops. Bracteal leaves, or bracts, are of similar character, and grow beneath and about the flowers, of which, when they are colored, they often form the most conspicuous part; but frequently they are green and are connected with true leaves by intermediate forms. Both scales and bracts have been forced, under experimental conditions, to develop into true leaves.

The modified leaves which form the flowers of phanerogams are termed «floral leaves,» and, as has been said, typically succeed one another in whorls from below upward, as sepals, petals, stamens and carpels. The sepals are usually green and much like foliage-leaves; the sepals often retain a likeness, but the interior whorls usually bear no resemblance to leaves, yet occasionally, in ill-health, revert to a shape which betrays their origin and genetic history.

Periodicity of Leaf Growth.— Leaves are a temporary part of the plant, arising and disappearing at more or less regular intervals, usually once a year. This is especially noticeable in the higher plants, some of which (annuals) die in autumn completely, surviving as species only in their seeds; others die down to the roots in the fall and put forth entirely new stems as well as leaves the following spring; while others, as shrubs and tree, die only so far as their leaves are concerned, putting forth new foliage after the stated period of rest. This period is due to the arrival of annually recurring unfavorable conditions of temperature or moisture or both, when the activity of life in the plant is suspended and it ceases to feed or grow. In such a state leaves having no function are needless — in fact often harmful — and in many cases die and fall off in so sudden and conspicuous a manner that we say such trees are deciduous; while others, which we call evergreen, retain most of their leaves in a green condition until gradually replaced by new ones, so that the foliage seems to be perpetual. The brilliant colors of the dying leaves of many trees and herbs in autumn are due partly to chemical changes in the decaying chlorophyll, and partly to the exposure of pigment cells previously concealed by the abundance of chlorophyll and other features of vital activity. The leaf drops because it no longer receives nourishment from the stem or twig. The cells at its base close up, transmitting no more sap, and in so doing separate from those in the base of the leaf, which is thus cut off and thrown away.

Bibliography.— The morphology, genesis, and functions of leaves have been studied most deeply by German students, as Haeckel, Fritz Müller, Göbel, Schwender, Marchlewski, Fisher, and others. These and other authorities have been well summarized in the English translation by Porter of Strasburger's ‹Text-book of Botany› (1903). For the forms and nomenclature of leaves, see the botanical manuals and text-books of Gray, Wood, and other American authors.

ERNEST INGERSOLL.

Leaves of Grass, a collection of fleshly poems by Walt Whitman (q.v.) published in 1855.

Leavitt, lĕv'ĭt, **Joshua,** American editor: b. Heath, Mass., 8 Sept. 1794; d. Brooklyn, N. Y., 16 Jan. 1873. He was graduated at Yale College in 1814 and was admitted to the bar in 1819. In 1825 he graduated at Yale Divinity School and in 1831 became editor of the New York ‹Evangelist.› He was an active member of American Anti-Slavery Society in 1833, and from 1837 to 1840 was editor of the society's journal, ‹The Emancipator.› He was an active promoter of the «Liberty» and «Free Soil» parties. In 1848 he became one of the editors of the ‹Independent,› retaining a position here until his death. He compiled ‹The Christian Lyre› (1834).

Lebanon, lĕb'ạ-nŏn, Ind., city, county-seat of Boone County; on the Chicago & S. and the Cleveland, C., C. & St. L. R.R.'s; about 30 miles northwest of Indianapolis. The first permanent settlement was made in 1824, and the city was chartered in 1875. Its chief industrial establishments are flour and lumber mills, grain elevators, novelty works, and a natural-gas plant. The government is vested in a mayor, whose term of office is four years, and a council. The waterworks are owned and operated by the city. Pop. (1900) 4,465.

Lebanon, Ky., city, county-seat of Marion County; on the Louisville & N. railroad; about 52 miles southwest of Lexington, the capital of the State, and 70 miles south of Louisville. It is situated in an agricultural region, and is the trade centre for an extensive section. The chief manufactures are flour, meal, whiskey, furniture, wagons and carriages. A large amount of live-stock is shipped from Lebanon. It is the seat of Saint Augustine's Academy, under the auspices of the Roman Catholic Church, and of a public and parish high school and good graded schools. Several churches, and the city and county buildings are among the prominent buildings. The city owns and operates the waterworks. Pop. (1900) 3,043.

Lebanon, Mo., city, county-seat of Laclede County; on the Saint Louis & S. F. railroad; about 55 miles northeast of Springfield. It is situated in an agricultural region and is the trade centre for a large extent of country. Its chief manufactures are flour, machine-shop products, lumber, bricks, and dairy products. Its trade is principally in the manufactured products, live-stock, fruit, hay, and vegetables. The city, though small, is a well-known health resort because of its mineral springs. Pop. (1900) 2,125.

Lebanon, N. H., town, one of the county-seats of Grafton County; on the Mascoma River, a few miles from its junction with the Connecticut River; and on the Boston & M. railroad. It is about 68 miles northwest of Concord, the capital of the State. It was settled about 1762, by people from the vicinity of Lebanon, Conn., who named their new home after the Connecticut town. It is situated in an agricultural region, but the extensive water-power supplied by the Mascoma River has made it an important manufacturing town. The chief manufactures are woolen goods, machinery, agricultural implements, wooden ware, men's clothing, sash, doors, and blinds, snow-shovels, flour, dairy products, and lumber. It has large brick-yards and granite-works. Over 1,000 persons are employed in the manufactories. The annual town-meeting is still the governing power. Pop. (1900) 4,965.

Lebanon, Ohio, village, county-seat of Warren County; on the Dayton, L. & C. and the Cincinnati, L. & N. R.R's; about 73 miles southwest of Columbus and 25 miles northeast of Cincinnati. It was laid out as a village in 1802. It is situated in an agricultural region and its industries are connected with farm products. It is the seat of the National Normal University, a private institution, which in 1903 had in attendance nearly 3,000 pupils. The Mechanics' Institute Library has about 5,000 volumes. There is one orphan asylum. The city owns and operates the electric-light plant and the waterworks. Pop. (1900) 2,867.

Lebanon, Pa., city, county-seat of Lebanon County; on the Cornwall & L. and the Philadelphia & R. R.R.'s; about 66 miles northwest of Philadelphia and 23 miles northeast of Harrisburg. Lebanon was settled as early as 1700 by German emigrants. The borough of Lebanon was laid out by George Steitz, in 1750, and was first called Steitztown. It was incorporated in 1820 and chartered as a city in 1885. It is situated in the Lebanon Valley, noted for the fertility of its soil; but the largest part of the wealth of the city comes from the quarries and mines of the vicinity. The Cornwall iron mines, about five miles distant from the city, the limestone and brownstone at the base of the mountains, the brick-clay, the iron ore, all contribute to the industrial wealth of Lebanon. Its chief industrial establishments are furnaces and foundries, rolling-mills, steel-plants, machine-shops, a very large nut and bolt works, chain-works, a creamery, employing a total of about 10,000 persons. The educational institutions are the public and parish schools, the Lebanon Business College, the School of Telegraphy, and four libraries. It has a large number of churches. Some of the prominent public buildings are the court-house, county-house, and post-office. There are six banks with a combined capital of $700,000. The annual business amounts to over $10,000,000. The predominating nationalities are, in order of numbers: American (a large majority), Irish, Germans, Hungarians, Italians, and a few Chinese. Pop. (1890) 14,664; (1900) 17,628.

John W. Harbeson,
Ex-Mayor.

Lebanon, Tenn., town, county-seat of Wilson County; on the Nashville, C. & St. L. railroad; about 35 miles east of Nashville. It is situated in an agricultural region, and its trade and industries are connected with farming products. It ships large quantities of hay, butter, and poultry. It is the seat of Lebanon College for Young Women, and of Cumberland University, founded in 1842 by the Cumberland Presbyterians. Pop. (1900) 1,956.

Lebanon, Cedars of. See Cedar.

Lebanon, Mountains of, Syria, two nearly parallel mountain ranges which, commencing at about lat. 34° 25′ N., stretch south-southwest toward Palestine, enclosing between them a valley about 70 miles long by 15 miles wide, now simply distinguished by the name of El-Bukaa, "the valley," but known anciently by the name of Cœlē-Syria. To distinguish the two ranges that on the west is called Lebanon, and that on the east Anti-Lebanon; the Arabs, call the former Jebel-Libnan, and the latter Jebel-esh-Shurky. Lebanon, which runs almost parallel to the Mediterranean coast, and at no great distance from it, may be considered as terminating near the coast, a little north of the mouth of the Litani, between Tyre and Sidon. It is the loftier range of the two, and presents almost a continuous ridge without any marked break. Its loftiest summit — Dhor-el-Khodih, in the north, has a height as given by barometer of 10,060 feet. Anti-Lebanon has a much lower average height, and the culminating point of this chain Jebel-esh-Sheikh, situated west-southwest from Damascus, has a height stated to be about 9,000 feet. The prevailing rock of Lebanon is limestone, of a whitish color; and from this its name, which means «white,» is supposed to be derived, though others ascribe it to the snows which cover it. The loftiest summits of Lebanon, presenting lofty precipices and wild narrow gorges, are almost absolutely barren; but at some distance below, vegetation makes its appearance, the pastures become verdant, and, by means of artificial terraces, cultivation is successfully carried on upon rugged slopes where it would otherwise be impossible. The habitable districts are occupied toward the north by the Maronite Christians, a hardy and industrious race, and toward the south by the warlike Druses. Numerous villages and convents are to be seen on the sides and summits of the cliffs. The forests of cedar for which Lebanon was anciently celebrated are represented by a few groves on Lebanon, there being none now on Anti-Lebanon. (See Cedar.) The other prevailing forest trees are firs and oaks. The vine is largely cultivated, and olive, fig, and mulberry trees abound. Considerable numbers of wild beasts, as the jackal, hyena, wolf, bear, and panther, inhabit the glens and higher peaks.

Lebanon Springs, N. Y., village, in the northeastern part of Columbia County; on the Lebanon Springs railroad; about 25 miles southeast of Albany. It is in a fertile agricultural region, and is a favorite health resort because of its mineral springs. A community of Shakers (q.v.) who live in the village and vicinity make brooms and baskets, and cultivate extensive gardens. They sell considerable garden seed. Pop. of the town 3,000; of the village 700.

Lebanon Valley College, a coeducational institution, founded, in 1867, at Annville, Pa. It is under the auspices of the United Brethren. The college has five courses which lead to the degree of Bachelor of Arts; and normal, art, music, and preparatory departments. It has 15 scholarships, and the productive fund, in 1903, was about $162,000; the income from the productive fund and the tuitions was in 1902, $15,442. In 1903 there were connected with the school 29 professors and instructors, and 460 students.

Le Bas, Philippe, fē-lēp lė-bā̆, French historian and archæologist: b. Paris 17 June 1794; d. there 1861. At 16 he entered the navy, which he left three years later for the army and he shared in the campaigns of 1813–14. In 1820 he was chosen by Queen Hortense to act as tutor to Prince Louis Napoleon, now Napoleon III., with whom he remained until October 1827. After holding professorships at Paris successively of history and of the Greek language and literature, he was commissioned in 1842 by the French government to undertake a tour of archæological investigation in Greece and Asia Minor, during which he made many valuable discoveries. He published books on very varied subjects, embracing essays on classical inscriptions, editions of ancient authors, travels, ancient and mediæval history, politics, instruction in German, and translations from German and English. His best known works are his ‹Explication des Inscriptions Grecques et Latines recueillées en Grèce› (1835–7), and ‹Voyage archéologique en Grèce et en Asie Mineure› (1847 et seq.).

Lebaudy Airship, The, a remarkable invention of M. Lebaudy, of Paris, France; an airship of the balloon type which is asymmetrical in form, its midship frame being situated slightly toward the front. The total length is 190.24 feet. The midship frame is situated at 81.67 feet from the prow and 108.57 from the stern. The extreme diameter of the balloon is 32.14 feet. With respect to the length of 190.24 feet we have thus an elongation of 5.6 diameters. In the entire median part of the section of the fusiform bag is not a complete circle, but a segment limited by a chord at its lower part. This means that the balloon presents a flat portion fixed to a linen-covered plane and held by a rigid frame which is attached to the side of the bag and, on the other hand, supports the suspension. The surface of the bag is about 13,000 square feet. Its weight, stitching included, is about 880 pounds. The car has the form of a flat-bottomed pontoon with pointed extremities. It is 15.75 feet in length, 5.25 in width, and 3.28 in depth. It is formed of a metallic frame. The motive power is furnished by a 40-horse-power motor cooled by a circulation of water and a radiator. The gasoline tank is placed beneath the car and the motor, as a measure of precaution against fire. A little compressed air is sent to it by means of a bicycle pump for feeding during the setting in operation. The exhaust pressure afterward suffices. The motor uses 30.8 pounds of gasoline per hour, say about 6 fluid ounces per horse-power. The motor actuates two double-bladed propellers arranged on each side of the car at the extremities of a hollow horizontal journal, in the interior of which revolves the driving shaft. The transmission to the propellers is effected through the intermedium of bevel wheels protected by casings. The most remarkable flight of the Lebaudy airship was made 12 Nov. 1903, and will no doubt mark a date in the annals of aërial navigation. The airship covered about 38 miles in 1 hour 41 minutes, and came back to the starting point. After passing over the Seine region to the west of Paris it crossed the Forest of Saint Germain, then entered the city by way of the Bois de Boulogne. The airship was then headed direct for the Eiffel Tower, which it reached, and landed just behind it, carrying out the original intention. At the start the operator had 640 pounds of ballast, and threw out 286 during the trip. The maximum altitude reached was 1,000 feet, and the mean 330 feet. As to the speed the airship made on this trip, it was reckoned at 22.4 miles an hour. See also Balloon; Flying Machine.

Lebel, Nicolas, French soldier and inventor: b. Angers 18 Aug. 1835; d. Vitré, Ile-et-Vilaine, 6 June 1891. He entered the Military School of Saint Cyr in 1855, served as captain in the Northern Army during the campaign of 1870, and became director of the Musketry School at Tours, and in 1883 at Chalons. The same year he was appointed member of the commission on securing an improved rifle for the infantry. The commission decided in favor of the small-bore rifle offered by Lebel, and known as the «fusil Lebel,» which was introduced into the French army in 1886. He was present as colonel at the battle of Sedan, but sickness cut short his military career, and in 1890 he was placed on the retired list. He was subsequently put in charge of the Inland Revenue Department at Vitré.

Leblanc, Nicolas, French chemist: b. Issoudun, department of Indre, 1766; d. 16 Jan. 1806. He studied medicine, was appointed surgeon to the Duke of Orleans and, after the Revolution, administrator of the department of the Seine. His name is associated with the process of converting common salt into carbonate of soda, a matter to which he turned his attention in 1786, when the Academy offered a prize of 2,400 livres for the discovery. His first endeavors did not yield a decisive result, but led to an accidental discovery by Dizé, an assistant of Jean Darcet (q.v.) at the College of France, through which success was attained. With the Duke of Orleans and another, Leblanc and Dizé formed a partnership and began to make soda. The Revolution wrecked their enterprise. Despite his patent, secured in 1791, Leblanc was compelled by the committee of public safety to disclose the secret of the process, and the manufacture became open to all. After years of poverty and fruitless efforts for redress, he committed suicide. The discovery of the essential features of the process was assigned to him in 1855 by a commission of the Academy, although the claim of Dizé was strongly advocated. As to the value of the process itself there is no doubt. It has made soda cheap, thereby facilitating the manufacture of soap, the cleansing and bleaching of cloth, etc.; has promoted the manufacture of sulphuric acid, and thereby the utilization of metallic sulphides; and has originated the manufacture of chlorine and of bleaching-powder. The Leblanc soda-process is still in extensive use, but is now dependent more on its by-products than on its output of soda. One half of the world's soda is now made by the ammonia-soda or Solvay process. See SODA.

Lebrun, Charles, French painter: b. Paris 24 Feb. 1619; d. there 12 Feb. 1690. He was the son of a sculptor, but early turned his attention to painting and became the pupil of P. Perrier and S. Vouet. He was especially attracted by the Italian masters, examples of which he copied in the gallery at Fontainebleau so that in his fifteenth year his works won the patronage of Cardinal Richelieu. Chancellor Seguier provided means for him to visit Rome and during his residence there (1642–6) he studied under Poussin, at the same time paying much attention to the antique, and the paintings of the early masters. In 1846 he returned to France, and assisted in founding the Royal Academy of Arts and Sciences, in which he became professor, chancellor, and in 1683 director. He was also director of the Gobelin tapestry manufactory. In 1662 Louis XIV. appointed him court painter, ennobled him and made him curator of his art collections. He was meanwhile engaged in decorating the Apollo gallery in the Louvre. In 1668 the king appointed him superintendent of works in the building of Saint Germain. He also decorated with paintings the royal chateau at Sceaux, and designed the statues and fountains for the park, etc. In 1679 he undertook his greatest work, the interior decoration of the palace at Versailles, and in the Great Gallery portrayed the achievements of Louis XIV. Very many paintings of his are still to be seen in the Louvre. His works are characterized by abundant invention and facility of execution; they reflect the spirit of the contemporary Italian school, but are marred by excessive straining after effect, flatness of design, and falsity of colortone. His vast canvas, 'Portrait of the banker Jabech of Cologne and Family,' is in the Berlin Museum. He exercised a despotic influence over French art of his time. He wrote 'Traité sur la Physiognomie' and 'Methode pour apprendre à dessiner les Passions.' Consult: Generay, 'Le Style Louis XIV.' (1885); and Jovin, 'Charles Lebrun, et les Arts sous Louis XIV.' (1890).

Lebrun, Charles François, shärl frăṅ-swä lė-brŭṅ, DUC DE PIACENZA, French administrator: b. St. Sauveur-Landelin 19 March 1739; d. near Dourdan 16 June 1824. He was appointed inspector of crown-lands, later entered the States-General and the Constituent Assembly, was appointed governor of Seine-et-Oise in 1791, sat in the council of Five Hundred, of which he was chosen president, and was made third consul by Bonaparte for services on the 18th Brumaire. In 1807 he reorganized the administration of the exchequer, and after a long retirement reentered public life as governor of Holland in 1810. He translated the 'Iliad,' the 'Odyssey,' and the 'Jerusalem Delivered.' Consult his 'Memoirs' (1829).

Lebrun, Marie Louise Elisabeth, French painter: b. Paris 16 April 1755; d. there 30 March 1842. She was trained under Doyen, Joseph Vernet and Greutze and chose portrait painting as her specialty. She left a great number of portraits in oil and pastel. About 600 are identified as her works of which the most important are, her portrait of herself with her little daughter (in the Louvre); her portrait of herself in the Uffizi Gallery at Florence); Marie Antoinette with her three children (in the museum at Versailles). In 1783 she was elected a member of the Academy. During the French Revolution she took refuge in the various European capitals, where she painted portraits of the reigning princes, and members of their families; as well as of the most famous people of the time. Few works of hers are to be met with except in private collections. She published 'Souvenirs de ma Vie' (Paris 1837).

Le Brun, Napoleon Eugene Charles Henry, American architect: b. of French parents, Philadelphia 2 Jan. 1821; d. New York 9 July 1901. He was a pupil of Thomas U. Walter, the architect, and from 1842 to 1861 practised his profession in Philadelphia where his most notable work is the Roman Catholic cathedral in Logan Square. He removed to New York in 1861 and among structures there which were designed by him with his son, are the Foundling Asylum and the Metropolitan Life Insurance building in Madison Square.

Lebrun, Ponce Denis Ecouchard, pôns dĕnē ā-koo-shär, called **Lebrun-Pindare,** French poet: b. Paris 11 Aug. 1729; d. there 2 Sept. 1807. His title 'Pindar' is due to the form and the mythological allusions of his odes, not to any large poetical merit, either in them or the lyrics; and as a satirist, he alternately groveled before and libeled the same men. His best odes are addressed to Buffon. He excelled in the composition of madrigals and epigrams; the latter relate for the most part to his quarrels with other authors.

Le Caron, Joseph, zhō-zĕf lė kä-rôṅ, French missionary: d. 1632. He was a Franciscan, belonging to the congregation of Recollets. His work in Canada, which he reached in 1615, was chiefly among the Huron tribe, and he was the first European to explore the lake of that name. His indefatigable labors among the Indians met with scant success, though he left some valuable information concerning their language. After General Wolfe's capture of Quebec (1629) he was deported to England with others of the French population and never returned to the monastery which he had built in that city.

Lecce, ancient Lycia, or Lupia, southern Italy. The town is situated in the province of Lecce, on a plain between the Adriatic on the north, the Gulf of Taranto on the west, and the Ionian Sea on the south. It has many interesting edifices, especially churches and convents, some of which contain admirable works of art. At the gate of St. Biagio is a triumphal arch erected in commemoration of the entrance of Charles V. There is a public library and there are well-established day and evening schools and numerous charitable institutions. Lecce was very flourishing during the Roman period, escaped the barbarians, and in 1000 A.D. was governed by its own counts. Pop. 23,000.

Lecco, lĕk'kō, **Lake of** (It. *Lago di Lecco*), the name given to the southeastern arm of Lake Como in Italy. Some of the large streams of the northern part of Italy flow into Lake Lecco. The town of Lecco and many pretty villages are on its shores.

Lech, lĕʜ, a river which has its rise in the Alps, in Vorarlberg, in Switzerland, flows east and north until it enters Bavaria, after which its course is almost directly north to Donauwörth where it unites with the Danube. Its length is nearly 200 miles. It is not a navigable stream but it has extensive water-power. On this river, near Rain, about five miles below Donauwörth, Tilly was defeated and killed, 5 April 1632, by a Swedish force under Gustavus Adolphus.

Leche, lē-chē, in zoology, the *Onotragus leche,* from South Africa. It is a water antelope, frequenting damp, marshy places, and taking to impassable swamps. It goes in considerable herds, and may be known by the peculiar way in which it allows its horns to recline, almost touching the withers.

Lechford, Thomas, American colonial lawyer: d. about 1645. He came to the Massachusetts Bay Colony in 1638 and was the earliest lawyer in Boston. He was regarded with great suspicion by the colonial authorities on account of his profession, and the nature of his religious opinions, and he found extreme difficulty in making a living. He therefore, in 1641, returned to England, where his book, 'Plain Dealing, or News from New England,' was printed in 1642. It is a valuable source of information respecting details of early colonial existence, and in 1644 was reprinted with the new title, 'New England's Advice to Old England.' A modern edition, annotated by J. H. Trumbull (q.v.), appeared in 1867.

Lecidea, in botany, the typical genus of the *Lecidinei.* The apothecia have a border colored like the disk. It is very extensive, and is found in a great variety of situations, and at every season of the year. *Lecidea geographica* is sometimes sulphur-yellow and sometimes yellowish-geen. If a yellow specimen be suspended over a solution of carbonate of ammonia, it becomes covered with carmine-red globules, gradually loses its usnic acid, and then becomes grayish-white.

Lecithin, lē-cĭ-thin, in chemistry, a name applied to several phosphoretted fatty bodies, of very similar chemical and physical properties, derived from brain substance, nerves, blood, gall, the yelk of eggs, etc., and also from some vegetable substances (maize, etc.), and which appear as constant constituents of the cell substance of organized bodies. It is a viscous body, insoluble in water, slightly soluble in cold alcohol, but very soluble in boiling alcohol and in ether. From its saturated solution in alcohol, it crystallizes in radially-grouped needles, which dry up *in vacuo* to a white powder. It may also be crystallized from glacial acetic acid. Every lecithin is a fat containing only two fatty acid radicals, the third hydroxyl group being replaced by ethylen-trimethyl ammonic hydrate (neurine) in combination with phosphoric acid.

Lecky, lĕk'ĭ, **William Edward Hartpole,** English historian: b. Newtown Park, near Dublin, 26 March 1838; d. London 23 Oct. 1903. He was educated at Cheltenham College, and at Trinity College, Dublin, whence he was graduated in 1859, and in 1861 published anonymously his first work, 'Leaders of Public Opinion in Ireland,' dealing with Swift, Flood, Grattan, and O'Connell, which appeared under his name in a new edition in 1871. An important 'History of the Rise and Influence of the Spirit of Rationalism in Europe' followed in 1861–5 and ensured him wide reputation as scholar and thinker. His 'History of European Morals from Augustus to Charlemagne' (1869) displayed a profound knowledge though its conclusions were not always sound. His most elaborate and valuable work is a 'History of England in the Eighteenth Century' (Vols. I.–II., 1878; III.–IV., 1882; V.–VI., 1887; VII.–VIII., 1890), in which he treats very fully of Irish affairs to the time of the Addington ministry. In a new edition of this history, published in 12 volumes in 1893, the chapters on Ireland were removed from their original context and arranged in a continuous narrative occupying the last five volumes. This work is in reality a history of civilization for the period covered; treating of the forces contributed to the making of 19th century England, whether of native or of foreign origin. Lecky's other works are: 'Poems' (1891); 'Democracy and Liberty' (1896), in which he arraigns modern British political life, and makes some comments upon Gladstone which once aroused considerable discussion; and 'The Map of Life: Conduct and Character' (1899). In 1895 he was elected to the House of Commons as member for the University of Dublin, and in 1897 was sworn of the Privy Council. In politics he was at first a Liberal and from 1886 a Liberal-Unionist with an undisguised aversion to democratic government. He became corresponding member of the Institute of France in 1894, and an honorary member of the Royal English Academy upon its organization.

Leclaire, Edmé-Jean, ĕd-mā-zhŏṅ lė-klăr, French social scientist: b. Aisy-sur-Armançon 14 May 1801; d. Herblay 10 Aug. 1872. At first a farm-worker, then apprentice to a mason, he afterward apprenticed himself to a house-painter in Paris, and in 1827 began the painting business on his own account. He proved remarkably successful, and soon took a leading position in his trade. In 1835 the principle of profit-sharing (q.v.) was proposed to him, and in 1842 he began to put it in practice in his own establishment, dividing the amount available in sums proportioned to yearly wages. A mutual-aid society which he formed in 1838 and reorganized in 1853 sustained itself from the latter year on the profits which were shared among the members. In 1864 the right to a division of the funds of the society was superseded by a system of retiring pensions. Leclaire was elected maire of Herblay in 1865. In the company which he founded his plan of distribution is still adhered to with continued success.

Leclaire, lė-klăr′, Ill., village, in Madison County, adjoining Edwardsville, the county-seat and post-office; on the Toledo, St. L. & W., the Chicago, P. & St. L., and a spur of the Wabash R.R.'s; 18 miles northeast of St. Louis. It contains the factories of the Nelson Manufacturing Company, the residences of its officers, of a number of the employees, and of some others. The village was founded by the Nelson Manufacturing Company, which, in 1886, adopted what is known as the «profit-sharing plan,»— dividing the profits of the business with the employees. After testing this plan, it was decided that more and better service could be rendered to the employees by providing good homes and social and educational facilities, than by simply paying a contingent increase in wages. In 1890 the company acquired 125 acres of high, rich, gently undulating corn land, well adapted to growing everything from blue-grass to watermelons. The tract abuts on the railroads mentioned. Coal underlies the land and there are coal-fields nearby. About 10 acres are reserved for factory purposes, 10 for a campus and other public uses, and the remainder for homes and farming use. All of the improvements, industrial, educational, and the buildings for homes, were started simultaneously. The manufacturing establishments are (1903) five factory buildings, a power-house, a dry-house, and some miscellaneous buildings, all made of brick. There are about 250 employees, who are engaged in making plumbing goods of iron, brass, wood, and marble; all of which goods are made from the raw product up to the finished article. None of what is called «raw material» is manufactured here. Adjoining the factory acres are first the bowling alley and the billiard room, then the ball grounds, next the school-house, the lecture and dancing-hall, and a skating lake. There are winding roads made of cinders, kept smooth, sprinkled in summer, never dusty and never muddy. These roads are bordered by concrete and board sidewalks and trees. The houses built for the employees by the company may be purchased and, if desired, paid for in installments about equal to city rents. The houses are mostly three to six rooms, and are built on lots with from 50 to 100 feet frontage, by 140 to 180 feet depths. They have well-kept lawns, flower beds, shade trees, fruit trees, and gardens.

There is no political organization in Leclaire; all are subject only to the State laws. There are no rules, no «Don't» signs, no boss. No case of disorder has yet (1903) occurred. There are no saloons. The church needs are supplied by Edwardsville. There has always been a kindergarten, and an «Industrial School» has been founded, wherein the pupils work half the time at productive labor and study the other half. The pupils living at home are not obliged to work. Those from a distance get their tuition and living free; they learn how to work and acquire a trade at the same time that they learn from books and capable teachers. No examination is required for entrance. The school is prepared to teach all from the lowest to the highest grade, and the pupils are promoted as rapidly as the results of their work merit. The work in the school consists of house building, farming, and varied factory work. Whenever a pupil becomes sufficiently proficient to earn, at the regular value of his work, more than the cost of his schooling and living expenses, he is paid the excess in money. The intention is to civilize work, to take it out of the category of drudgery and put it in the list of arts and crafts, to make the pupils intelligent workmen and skilled craftsmen. In this school there is a weekly lecture on hygiene, given by an experienced, broad-minded physician. The village has a free library, and each winter a course of lectures is given, two each month, with occasional musicales. A singing school is held one night each week, and a bowling party for the school and the children also one night a week, and occasionally excursions to St. Louis. In the summer there are excursions from St. Louis to Leclaire, sometimes entire train-loads of children for a day's outing. Leclaire is founded and built on simple lines; the complex and strenuous are avoided, good-will, simplicity, and the domestic enjoyments are fostered.

N. O. Nelson,
Leclaire, Ill.

Le Clear, Thomas, American painter: b. Owego, N. Y., 1818; d. New York 1882. He painted portraits in London, Canada, before he had received any instruction in art, and left that place about 1832 for New York, where he made his principal residence. He was elected a national academician in 1863. Besides his portraits, which are clever in characterization and full of life and expression, he has painted many genres, such as 'Marble Players'; 'The Itinerant' (1862); and 'Young America.' Among his portraits are those of 'William Page' in the Corcoran Gallery at Washington; and 'George Bancroft' in the Century Club, New York.

Le Clerc, lė-klăr, **John,** or **Johannes Cler′icus,** Swiss theologian: b. Geneva, Switzerland, 19 March 1657; d. Amsterdam, Netherlands, 8 Jan. 1736 He began to study theology and philosophy in his native town, and continued his studies at Grenoble, Saumur, Paris, and London. He gradually adopted the views of the Remonstrants, as the adherents of Arminius (q.v.) were then called. In 1684 he was appointed to the faculty of the Remonstrant College at Amsterdam; but in 1728 a stroke of apoplexy deprived him of his power of speech, which he never recovered. His influence has been most widely felt through his writings, which are voluminous. He edited the ‘Apostolic Fathers of Cotelerius’ (1698), and the views he held about Mosaic authorship, inspiration and kindred topics seemed to anticipate some recent deductions from the Higher Criticism. Besides a Bible commentary he published: ‘Bibliothèque universelle et historique’ (25 vols. 1686–93); ‘Bibliothèque choisie’ (28 vols. 1703–13); and ‘Bibliothèque ancienne et moderne’ (29 vols. 1714–26).

Le Clerc, Sébastien. See CLERC, SÉBASTIEN LE.

Le Clerq, Chrétien, krā-tē-ŏṅ lė klăr, French missionary: b. Artois, France, about 1630; d. Lens, France, about 1695. He labored for six years on the Island of Gaspé as a Recollet missionary with others of his order (1651–61), and then built a house for the Recollets in Montreal with money collected in France. After resuming his unsuccessful missionary work at Gaspé he returned to France. His works are interesting as throwing a side light upon early Canadian history, but are tinged with ecclesiastical partiality for Frontenac, who favored the Recollets at the expense of the Jesuits. These works are: ‘Nouvelle Relation de la Gaspésie’ (1691); and ‘Establishment of the Faith in New France’ (English translation by John G. Shea 1881).

Lecocq, lė-kŏk, **Alexander Charles,** French composer: b. Paris 3 June 1832. He received his musical education in the Conservatory of the Capital, under Bazin and Halévy, and the earliest of his operas to appear was ‘Le Docteur Miracle,’ which had won the first Offenbach prize. His operetta ‘Fleur de Thé’ gained him the widest recognition. In this as in his later productions he followed the advice he had received from Offenbach, that the operetta should be elevated into a work of art. His principal operettas are: ‘Les Jumeaux de Bergame’ (1868); ‘Gandolfo’ (1869); ‘Le beau Dunois’ (1870); ‘La Fille de Madame Angot’ (1872); ‘Giroflé Girofla’ (1874); ‘La petite Mariée’ (1875); ‘Kosiki’ (1876); ‘Le Dompteur’ (1877); ‘Le petit Duc’ (1878); ‘La Rousette’ (1881); ‘Plutus’ (1886); etc. They are 42 in number, and have attained the most remarkable popularity in France and elsewhere.

Lecomp'ton, Kan., city, in Douglas County; on the Kansas River, and on the Atchison, T. & S. Fe railroad; about 15 miles east of Topeka. It was settled in 1854 by sympathizers with the slavery side of the question which was then before the people, in relation to the admission of new States. Lecompton was the headquarters of the pro-slavery men, and it was here that the Lecompton Constitution (q.v.) was framed, in the fall of 1857. The Lane University was founded here in 1865. The place was named in honor of Judge S. D. Lecomte, one of the early workers in Kansas. Pop. 500.

Lecompton Constitution, in Kansas history a form of territorial government, adopted by a convention held at Lecompton, Kan., in 1857, the legality of which in both form and action became a matter of dispute, and caused national discussion and congressional action. For several years prior to 1857 the slave question had agitated the territory, and numerous bloody quarrels between the Free State settlers and the Missourians who came across the border into Kansas, added fuel to the strife. In June 1857 the territorial legislature, composed entirely of pro-slavery men, chosen at an election at which the free-state men had declined to participate on the ground of its illegality, met at Lecompton, and among other acts passed one providing for the election of a convention to frame a State constitution for Kansas. Meanwhile Congress had passed a bill declaring void all the enactments of the Kansas legislature on the ground that they were cruel and oppressive. The election for delegates to the constitutional convention was held 15 June, but the free-state men took no part in it. Only 2,000 votes were cast, while the legal voters in the territory numbered 10,000. The constitutional convention met at Lecompton in November and adopted a constitution, four sections of which related to slavery, declaring the rights of owners to their slaves to be inviolable, and prohibiting the legislature from passing acts of emancipation. This provision alone was to be submitted to the people at an election to be held 21 December. The ballots cast were to be endorsed: «Constitution with slavery,» or «Constitution with no slavery,» thus securing in any event the adoption of a constitution, several clauses of which, besides those submitted, were highly objectionable to a majority of the people. A provision was inserted preventing any amendment to the constitution previous to 1864. The promulgation of this constitution caused great excitement in Kansas.

At the election 21 December, the vote returned was 6,143, more than one half of which was from the counties along the Missouri border, whose total number of voters by the census did not exceed 1,000. Against the slavery clause there were but 569 votes, the free-state men generally abstaining from voting. The constitution being thus nominally adopted, an election for officers under it was to be held 4 January. At a special session the legislature passed an act submitting the Lecompton constitution to the direct vote of the people on the same day with the State election, and the result was 10,226 votes against it. Congress after a long discussion referred the matter to the people of Kansas at an election on 3 Aug. 1858, when the Lecompton constitution was again rejected by 10,000 majority. Meanwhile the territorial legislature had called another convention to meet in April to frame a new constitution, which was submitted to the people and ratified by a large majority, though by a small total vote. The territorial legislature met in January 1859 and passed an act submitting to the people the question of calling still another constitutional convention. Delegates were elected, and at a convention which met from 5 July to 27 July a constitution was finally adopted which prohibited slavery. This was ratified by a majority of 4,000 at the election 4 October, and the slavery question was at last settled and Kansas was admitted to the Union as a State 29 Jan. 1861. See also KANSAS; SLAVERY.

Lecomte Du Nouy, Jules Jean Antoine, zhül zhŏṅ äṅ-twän lė kôṅt dü noo-ē, French artist: b. Paris 10 June 1842. A pupil of Gleyre, Gérôme, and Signol at the Ecole des Beaux Arts, he won there the second Prix de Rome in 1865, and was afterward an annual exhibitor at the Salon. Among his canvases, somewhat dull in color but admirably correct in drawing and archæological exactness, are: 'The Sorcerer'; 'Bearers of Evil News before Pharoah'; 'Job and his Friends'; 'The Madness of Ajax'; and a portrait of Béranger.

Le Conte, lė kŏnt, **John,** American physicist: b. Liberty County, Ga., 4 Dec. 1818; d. Berkeley, Cal., 29 April 1891. He was a son of Lewis Le Conte (q.v.). He was graduated from Franklin College in 1838, from the College of Physicians and Surgeons, New York, in 1841; in 1846–55 was professor of natural philosophy and chemistry in Franklin College; in 1856–69 was professor of natural and mechanical philosophy in South Carolina College; in 1869 became professor of physics and industrial mechanics in the University of California; was president of the university in 1876–81; and in 1881 again assumed his professional duties. Among his publications were: 'The Philosophy of Medicine' (1849); and 'The Study of the Physical Sciences' (1858).

Le Conte, John Eaton, American naturalist: b. near Shrewsbury, N. J., 22 Feb. 1784; d. Philadelphia 21 Nov. 1860. He was a brother of Lewis Le Conte (q.v.). In 1813 he entered the army as a topographical engineer, and in 1831 was retired with the grade of major. He published 'Monographs of North American Species of Utricularia, Gratiola, and Ruellia,' and other studies in natural history.

Le Conte, John Lawrence, American entomologist: b. New York 13 May 1825; d. Philadelphia 15 Nov. 1883. He was a nephew of Lewis Le Conte (q.v.). He was graduated from Mount St. Mary's College (Emmitsburg, Md.) in 1842, from the College of Physicians and Surgeons in 1846, became a surgeon of volunteers in the Federal army in 1862, and was later made medical inspector United States army, with rank of lieutenant-colonel. In 1873 he was chosen to the presidency of the American Association for the Advancement of Science. He was generally recognized as an important authority on entomology; and published on that subject: 'Classification of the Coleoptera of North America' (1862–73); 'List of the Coleoptera of North America' (1866); and 'New Species of North American Coleoptera' (1866–73).

Le Conte, Joseph, American geologist: b. Liberty County, Ga., 26 Feb. 1823; d. Yosemite Valley, Cal., 6 July 1901. He was a son of Lewis Le Conte (q.v.). He was graduated from Franklin College, Georgia, in 1841, from the College of Physicians and Surgeons, New York, in 1845; practised medicine at Macon, Ga.; in 1850 became a pupil of Louis Agassiz, whom he accompanied on an expedition to Florida; and later was professor of natural science in Oglethorpe University, Georgia, and of natural history in Franklin College. In 1856–69 he was professor of chemistry and geology in the University of South Carolina, and from 1869 until his death held the chair of geology in the University of California. During the Civil War he was chemist in the Confederate medicine laboratory and later in the nitre and mining bureau at Columbia. S. C. He was vice-president of the International Geological Congress in 1891, and president of the American Association for the Advancement of Science in 1892. His contributions to geology include the determination of the character and age of the Cascade range; the description of the ancient glaciers of the Sierra Nevada; the development of what is called the «contractional theory» in mountain building; and researches in vein formation. He wrote also on optics, philosophy, biology, and other subjects. He was an editor of the 'Journal of Geology' and of 'Science,' and published: 'Religion and Science' (1873), a collection of lectures; 'Elements of Geology' (1878), his best known book; a 'Compend of Geology' (1884); 'Evolution: Its Nature, its Evidences, and its Relation to Religious Thought' (1887); and other writings. Consult his 'Autobiography,' edited by W. D. Armes (1903).

Le Conte, Lewis, American naturalist: b. near Shrewsbury, N. J., 4 Aug. 1782; d. Liberty County, Ga., 9 Jan. 1838. He was graduated from Columbia in 1799, studied medicine, on his plantation of Woodmanston, Ga., established a botanical garden, particularly rich in bulbous plants of the Cape of Good Hope, and a chemical laboratory where he conducted numerous researches. He published nothing, but was of admitted aid to many botanists in their labors.

Leconte de Lisle, Charles Marie René, shärl mä-rē rė-nā lė kônt dė lēl, French poet: b. Saint Paul, Ile de Bourbon (now Réunion), 23 Oct. 1818; d. Louveciennes 17 July 1894. When a young man he went to France, studied law at Rennes, and after a course of travel settled in Paris. His progress was slow, but gradually he gathered a group of young writers, and expanded his own work, whereby he won recognition as leader of the modern Parnassian school of poetry. It was some years before he found a publisher for 'Poèmes antiques' (1852), his first volume of real significance, but with 'Poèmes barbares' (1862) he gained an academic prize of 10,000 francs. In 1884 he published 'Poèmes tragiques,' and in 1895 appeared 'Derniers Poèmes,' a posthumous volume containing also critiques on his precursors in lyric poetry. His hand gave its impress to 'Le Parnasse contemporain,' a series of volumes published in 1866, 1869, and 1876, which is representative of his school, and in these some of his own most notable work was first seen. He also rendered valuable service to French literature by his superior translations of the 'Iliad' (1867), Hesiod (1869), the 'Orphic Hymns' (1869), the 'Odyssey' (1870), Horace (1873), Sophocles (1877), and Euripides (1885). In imitation of the Greek he wrote the dramas 'Les Erinnyes' (1872) and 'L'Apollonide,' based on the 'Ion' of Euripides. His poetry embodies a philosophy of human life in which he sought to combine art with scientific principles and to weave in one poetic fabric the mythical past with ideal visions yet to be realized by the race. In 1887 he was elected a member of the Academy.

Lecouvreur, lė-koov-rėr, **Adrienne,** French actress: b. Lamery, Champagne, 5 April 1692; d. Paris 20 March 1730. Arriving at Paris in her tenth year she made her first theatrical venture three years later, and was immediately engaged for the theatre at Lille. For the following ten years she was «on the road» as member of various traveling companies, but in

1717 was called to the ‘Comédie Française,’ and made her debut as Electra in Crebillon's tragedy. Her simple and natural impersonation made a deep impression on the most fastidious of audiences, and from that time she played the role of most of the heroines in Corneille and Racine with such success that she was welcomed into the most aristocratic circles of the city and was drawn into correspondence with some of the most intellectual men and women of the day, among whom was Voltaire. During the last ten years of her life she counted among her admirers Maurice of Saxony, Voltaire and Lord Peterborough. She perished by poison administered by the Duchesse de Bouillon, a jealous rival. This dénouement is the subject of the play ‘Adrienne Lecouvreur,’ by Scribe and Legouvé. Consult: Mouval, ‘Lettres d'Adrienne Lecouvreur’ (1892).

Le Creusot, France. See Creusot, Le.

Lec'tern, or **Lettern,** the reading-desk or stand on which the larger books used in the services of a church are placed. The most ancient lecterns were made of wood, and elaborately carved. Modern ones have been made of marble or brass, very ornamental in design and of excellent execution. They are sometimes made in the form of an eagle, the outspread wings of which form the support for the volume.

Lectionary, lĕk'shŏn-ā-rĭ (Lat. *lectionarium*) originally, a service-book of the church of the Middle Ages, so termed as it contained the lessons (*lectiones*) or passages of Scriptures read in the church service. The Roman Catholic Lectionary contained the epistles and gospels of the Roman missal, sometimes also all the lessons of the various services in the church, in which case it was termed the Plenarium. The most ancient known, the Gallican Lectionary, is believed to represent the rite of the ancient Gallican Church. It was published from a manuscript of the monastery of Luxeuil in 1685, by Mabillon (q.v.), who attributed it to the 7th century. It was written in Merovingian characters, it names the festival of St. Geneviève, and assigns three lessons to each mass, in accordance with the ancient Gallican liturgy.

In the Greek Church the lectionaries consist of lessons from the Gospels, from the Acts and Epistles. The Greek lectionary is called Synaxarion (*συναξὰριο*), and the oldest synaxarion extant is that prefixed to the Codex Cyprius (K), a manuscript of the New Testament which belongs to the 8th century.

The lectionary or calendar of the English Book of Common Prayer was first published in 1559, and contained two lessons, one from the Old Testament and one from the New for daily morning and evening prayer, and special lessons for Sundays and holidays. This lectionary was adopted by the Protestant Episcopal Church of the United States in 1789, but in 1883 the General Convention changed it by revision into the form which it now bears. In accordance with this assignment the Old Testament is appointed to be read through in the course of public worship once a year; the New Testament being read three times in the same period.

Lectister'nium, among the ancient Romans, a sacrifice of the nature of a feast offered to the gods, an evident survival of the idea common in early stages of religious development that divinities actually partook of the offerings presented to them. On occasions of extraordinary solemnity, or in times of public calamity, the Greeks and Romans placed tables with food before images of the gods reclining on couches. According to Livy the first Roman lectisternium took place 354 B.C., when a terrible plague affected the cattle. These sacrificial feasts were of two kinds — ordinary, occurring almost daily, and extraordinary, occurring at intervals, and lasting from three to eight days, or longer.

Lector (reader), a minister of the church who reads the Bible, and other writings of a religious character, to the people. The order of lectors is the second of the minor orders in the Roman Catholic, the first in the Greek Church. The office is now merely looked upon as one of the steps to the priesthood, and only in the office for Good Friday does the missal recognize the functions of the lector. Lectors were consecrated by prayers and sometimes by laying on of the hands for this office; the candidate must have completed the seventh year of his age. They are mentioned by Justin Martyr in the 2d century, and appear to have been proper officers of the church in the 3d century. The orders in the Roman Catholic Church are bishop, priest, deacon, sub-deacon, acolyte, exorcist, reader, ostiarius or door-keeper. See Orders, Holy.

Leda, lē'dạ, in Greek mythology, the wife of the Spartan king Tyndareüs. In order to enjoy her, Zeus changed himself into a swan, in which form he is represented with her in a picture from Herculaneum. By him she had Pollux and Helen, and by Tyndareus, Castor and Clytemnestra.

Ledeganck, lĕd-ė-gänk', **Karel Lodewyk,** Flemish poet: b. Eecloo 9 Nov. 1805; d. Ghent 19 March 1847. He is one of the most popular of Flemish writers. His first collection of poems was ‘Flowers of my Springtide’ (1839). His poem on ‘The Three Sister Cities’ — that is, Ghent, Bruges, Antwerp — is considered his finest production.

Ledochowski, Miecislas Halka, mē-ā-kēs'läs häl'kä led-ō-hŏv'skē, Polish Roman Catholic ecclesiastic: b. Galicia 29 Oct. 1822; d. Switzerland 28 July 1894. He studied theology and subsequently entered the papal diplomatic service and became papal auditor successively at Madrid, Lisbon, Rio de Janeiro, and Santiago de Chile. In 1861 he was appointed Archbishop of Thebes, while his appointment to the archbishopric of Gnesen and Posen in 1866 constituted him primate *ex officio* of Poland. He actively opposed the Prussian May laws by which Bismarck sought to subject the Roman Catholic Church in Germany to state control. In consequence of his opposition, his property was confiscated and himself imprisoned in 1873 for two years. He was made cardinal 15 March 1875, and in 1892 general prefect of the propaganda.

Ledru-Rollin, lė-drü-rōl-lăṅ, **Alexandre Auguste,** French political agitator: b. near Paris, France, 2 Feb. 1807; d. Fontenay-aux-Roses, France, 31 Dec. 1874. Admitted to the bar in 1830, he became prominent in the defense of Republican journalists and men of similar views in the reign of Louis Philippe, and later as a democratic agitator and leader of the workingmen's party. On the outbreak of the revolution of 1848 he became a member of the provisional government as minister of the interior, and in May was one of the five in whose hands the Constituent Assembly placed the interim government. But he offended everyone by his arbitrary conduct, and resigned. He was a candidate for the presidency against Louis Napoleon in the following December, but was ignominiously beaten. An unsuccessful attempt to provoke an insurrection against his rival put an end to his influence, and for the next 20 years he lived alternately in London and Brussels, being amnestied only in 1870. After his return to France he was elected to the Assembly in 1871, and again in 1874.

Le'dum Oil. See Labrador Tea.

Led'yard, John, American traveler: b. Groton, Conn., 1751; d. Cairo, Egypt, 17 Jan. 1789. He entered Dartmouth College in 1772, with a view of fitting himself for missionary duty among the Indians. The restraints of this mode of life proving irksome, he absented himself at one time from college for several months, during which he visited the Indians of the Six Nations; and, finally abandoning the idea of becoming a missionary, he embarked on the Connecticut River in a canoe of his own fashioning, and floated down to Hartford. After a brief experience as a theological student, he shipped at New London as a common sailor in a vessel bound for the Mediterranean, and at Gibraltar enlisted in a British regiment, but was discharged at the request of his captain. He accompanied Captain Cook on his third voyage round the world, 1776–80, and of this voyage he kept a private journal, which in accordance with a general order of the government was taken from him on the return of the expedition to England. Subsequently he wrote out from recollection, assisted by a brief sketch issued under the sanction of the admiralty, an account of the expedition, published in 1783. During the two years succeeding his return to England he remained in the British naval service, but steadily refused to take arms against his native country. In December 1782, he found means to escape. He intended to journey through northern Europe and Asia and after surmounting many obstacles arrived at Irkutsk, where on 24 Feb. 1788 he was arrested by order of the Empress Catherine, conducted with all speed to the frontiers of Poland, and there dismissed, with an intimation that he would be hanged if he re-entered Russia. Ledyard found his way back to London in the spring, and was cordially received by Sir Joseph Banks and others who had befriended him. Undaunted by previous adversities, he eagerly accepted an offer to undertake an expedition into the interior of Africa; and when asked how soon he would be ready to set out, replied: «To-morrow morning.» He departed from England in the latter part of June, intending to cross the African continent in a westerly direction from Sennaar, and had proceeded as far as Cairo, when he died. For capacity of endurance, resolution, and physical vigor, he was one of the most remarkable of modern travelers. Many extracts from his journals and his private correspondence with Jefferson and others are given in Spark's memoir of him.

Ledyard, William, American soldier: b. Groton, Conn., about 1750; d. Fort Griswold, Conn., 7 Sept. 1781. He held the commission of colonel in the militia of Connecticut, and during the marauding expedition of Arnold in September 1781, was in command of Forts Trumbull and Griswold, which protected New London. He refused a demand for the surrender of Fort Griswold, and resisted for nearly an hour the attack of a British force numbering 800 men. The command of the attacking force devolved upon Major Bromfield, a Tory, who effected an entrance into the fort after nearly 200 of his men had been disabled, including 48 killed, the Americans having lost about a dozen killed. To Bromfield's inquiry: «Who commands this garrison?» Ledyard replied: «I did, sir, but you do now,» at the same time handing him his sword. Bromfield immediately plunged it through the body of Ledyard, killing him upon the spot. A massacre of the Americans ensued, which was not ended until more than 100 of them were killed and wounded. A monument has been erected near the spot to commemorate this event.

Lee, Agnes Rand, American writer: b. Chicago. She has published ‘The Round Rabbit,’ a juvenile, and a translation of ‘The Poems of Theophile Gautier’ (1903).

Lee, Albert, American author and editor: b. New Orleans 11 May 1868. He was graduated from Yale in 1891, having during his senior year edited the ‘Yale Literary Magazine.’ In 1891–4, he was on the editorial staff of the New York *Sun*; in 1895 became editor of ‘Harper's Round Table’; and in 1899 was for a short time associate editor of ‘McClure's Magazine,’ becoming managing editor of ‘Harper's Weekly’ in the same year. In 1901–3 he was associate editor of ‘Collier's Weekly,’ taking the position of managing editor in January 1903. He has written ‘Tommy Toddles’ (1896); ‘Track Athletics in Detail’ (1897); ‘The Knave of Hearts’ (1897); ‘Four for a Fortune’ (1898); ‘He, She, and They’ (1899).

Lee, Alfred, American Protestant Episcopal bishop: b. Cambridge, Mass., 9 Sept. 1807; d. Wilmington, Del. 12 April 1887. He was graduated at Harvard in 1827, and after studying law practised for three years in New London, Conn. Feeling, however, that his vocation was elsewhere he was admitted to the General Theological Seminary, where he was graduated in 1837. He was elected rector of Calvary Church, Rockdale, Pa. (1838), but on being consecrated first bishop of Delaware in 1841, took charge of Saint Andrew's, Wilmington, the following year. He was a member of the American Committee for Revision of the New Testament (1881) and presiding bishop (1884–7). He is the author of ‘Life of Saint Peter’ (1852); ‘Life of Saint John’ (1854); ‘A Treatise on Baptism’ (1854); ‘Harbinger of Christ’ (1857); Co-operative Revision of the New Testament’ (1881); etc.

Lee, Ann, foundress of the Society of Shakers in America: b. Manchester, England, 29 Feb. 1736; d. Watervliet, N. Y., 8 Sept. 1784. She was the daughter of a blacksmith and uneducated, and in 1758 joined the Shakers, who had seceded from the Society of Friends. In 1762 she was married to a blacksmith named Standerin, or Stanley. She believed herself inspired, and in 1770 was imprisoned for preaching the new doctrine of celibacy. In 1774 she emigrated to America and founded at Watervliet two American Societies of Shakers. By her adherents she was called «Mother Ann.» See SHAKERS.

Lee, Arthur, American diplomatist: b. Stratford, Westmoreland County, Va., 21 Dec. 1740; d. Urbana, Middlesex County, Va., 12 Dec. 1792. He was educated at the University of Edinburgh; entered the practice of medicine at Williamsburg, Va.; studied law in the Temple, London (1766–70); practised in England in 1770–6; closely observed colonial questions; was a member of the society known as «The Supporters of the Bill of Rights,» by which ministerial measures were discussed; and in 1770 was appointed associate of Franklin as London agent of Massachusetts colony. When Congress appointed Franklin, Jay, and Dickinson a committee to correspond with friends of the colonies in other parts of the world, Lee became secret agent in London of the committee; and in 1776 he was chosen by Congress joint commissioner with Franklin and Deane to obtain a treaty of alliance with France. In 1777 he despatched special missions to the governments of Spain and Prussia; in 1778 became commissioner to Spain; but in 1779 was recalled owing to his disagreements with Franklin and Deane. He was a representative in the Virginia general assembly in 1781; a delegate to the Continental Congress in 1781–4; and a member of the board of treasury in 1784–9. He opposed the adoption of a Federal constitution. Consult R. H. Lee, ‹Life of Arthur Lee› (1829).

Lee, Charles, American soldier: b. Dernhall, Cheshire, England, 1731; d. Philadelphia 2 Oct. 1782. In 1751 he entered the English army as lieutenant of the 44th, which he accompanied to America in 1754, and with which he was present at Braddock's defeat on the Monongahela (9 July 1755). He was wounded in Abercrombie's attack on Ticonderoga (1 July 1758), took part in the capture of Montreal in 1760, and was promoted major in 1761. He served in Burgoyne's division in Portugal in 1762, and was for a time busy with a scheme for establishing in America two colonies, one on the Ohio, the other on the Illinois, to be recruited from Switzerland and Germany as well as New England. In 1764 he went to Poland, there was appointed to the staff of King Stanislaus Augustus, in 1766 accompanied the Polish embassy to Turkey, in 1769 as a major-general in the Polish army fought in a campaign against the Turks, and having called his superior officers fools, left the service and returned to England. He was made lieutenant-colonel on half-pay in 1772, but was further unrecognized by the British government, and in disappointment came to America 10 Nov. 1773, and by skilful display of what military knowledge he possessed attracted the attention of the Continental Congress, then eager to obtain competent leaders for the Revolutionary army. His career thenceforth was perhaps the strangest in the annals of the Revolution. He wished to become commander-in-chief of the American forces, but accepted the appointment as second of the major-generals, Artemas Ward (q.v.) being the first. To inspire public confidence he purchased for £5,000 Virginia currency (about £3,000 sterling), an estate in Berkeley County, Va.; but he did not assume his rank until guaranteed by Congress pecuniary indemnity for possible losses incurred in so doing. He undeservedly received popular credit for Moultrie's successful defense of Charleston, S. C. (28 June 1776), and was called the «Hero of Charleston.» In 1776 he became first major-general upon the resignation of Ward. He failed to obey when ordered by Washington to cross the Hudson from Westchester County with his 7,000 troops and join the latter in New Jersey; but when Washington was compelled to fall back on Princeton (2 Dec. 1776), crossed the river to Morristown and encamped there with 4,000 troops. Gates marched from Ticonderoga with seven regiments for Washington's aid, but Lee diverted three of the regiments to Morristown. Washington crossed the Delaware into Pennsylvania, and Lee diligently spread reports of the commander-in-chief's incapacity and planned a flank movement upon the British army whose success he intended should secure his own appointment to replace Washington. He was, however, captured at Baskingridge (13 Dec. 1775), and imprisoned at New York, where he deserted the American cause, and designed a plan for the subjugation of the American colonies, the original draft of which was found among the private papers of the Howes in 1857. He was exchanged in 1778, and re-entered the American service for reasons not fully known; but his insubordination at Monmouth (28 June 1778) nearly lost the day, and he was suspended from command for one year. A subsequent disrespectful letter to Congress caused his dismissal from the army. His treasonable correspondence with the British authorities was not discovered till many years after. He wrote ‹Strictures on a Friendly Address to all Reasonable Americans› (1774) in reply to Dr. Myles Cooper (q.v.); and made a foolish claim to be the author of the «Junius» letters. Consult the ‹Memoirs,› edited from his papers by Langworthy (1792); and Moore, ‹The Treason of Charles Lee› (1858).

Lee, Charles, American cabinet officer: b. Leesylvania, Va., 1758; d. Fauquier County, Va., 24 June 1815. He was a brother of Henry Lee, soldier (q.v.) He was graduated from the College of New Jersey in 1775; studied law in the office of Jared Ingersoll at Philadelphia; practised in Westmoreland County, Va.; and sat in the Virginia assembly. On 10 Dec. 1795 he was appointed by Washington attorney-general of the United States, and this office he filled until the last month of Adams' administration (1801). He declined an appointment by Jefferson as chief justice of the United States circuit court for the 4th circuit.

Lee, Eliza Buckminster, American prose writer: b. Portsmouth, N. H., 1794; d. Brookline, Mass., 22 June 1864. She was married to Thomas Lee of Boston, where the greater part of her life was spent. She was a popular author in her day and among her books are ‹Sketches of New England Life› (1837); ‹Delusion› (1839); a translation from the German of the ‹Life of Jean Paul Richter› (1842); ‹Naomi; or, Boston Two Hundred Years Ago› (1848); ‹Parthenia; or, The Last Days of

Paganism’ (1858); and a translation of Berthold Auerbach’s ‘Barefoot Maiden’ (1860).

Lee, Fitzhugh, American soldier and diplomatist: b. Clermont, Fairfax County, Va., 19 Nov. 1835; d. Washington, D. C., 28 April 1905. He was the nephew of Robert E. Lee (q.v.). Appointed as cadet at large to West Point by President Fillmore, he entered the Academy at 16, and was graduated in 1856, receiving an appointment to the famous Second Cavalry of which A. S. Johnston was colonel and R. E. Lee was lieutenant-colonel. After serving for a year at Carlisle Barracks as cavalry instructor of recruits, he reported to his regiment on the frontier of Texas and was greatly distinguished in several fights with the Indians, being mentioned in the official reports for skill and gallantry. In a fight with the Comanches, 13 May 1859, he was so severely wounded, being pierced through the lungs with an arrow, that the surgeons despaired of his life, but he recovered and joined his command, and led a part of his company in January 1860, in a very notable and successful fight with the Indians, in which he greatly distinguished himself in a single combat with an Indian chief. In November 1860 he was ordered to West Point as instructor of cavalry tactics. When Virginia seceded from the Union he promptly resigned his commission and tendered his services to his native State. He served for a time on the staff of General R. S. Ewell, and in September 1861 he became lieutenant-colonel, and in April 1862 colonel of the 1st Virginia cavalry. Henceforth he was intimately connected with Stuart’s cavalry and won constant reputation for dash, daring, and intelligent execution of duty. After the battles around Richmond he was made brigadier-general, his brigade consisting of the 1st, 3d, 4th, 5th, and 9th Virginia cavalry, and a battery of horse artillery. In the campaign against Pope and the Maryland campaign the cavalry rendered most important service, and Gen. Lee did his full duty in these operations. When General Robert Lee withdrew from Sharpsburg, Fitzhugh Lee’s brigade relieved the pickets and held the lines till the army had crossed the Potomac. On 17 March 1863 Averell’s division of 3,000 cavalry crossed the river at Beverly’s Ford, and attacked him; though he could only put 800 troopers in the saddle, he successfully resisted Averell, and after one of the most hotly contested cavalry battles of the war drove him back across the river. In the Chancellorsville movement he protected Jackson’s flank, and made a very important reconnoissance by which he located the flank and rear of the enemy, and enabled Jackson to attack it to the best advantage. In the autumn of 1863 he was made major-general, and given command of a division of cavalry. In the campaign of 1864 he rendered important service, holding in check the advance of Grant’s army until General R. E. Lee’s infantry could occupy Spottsylvania, repelling Sherman’s raid on Richmond, defeating Sheridan at Trevillians and Samaria Church, routing Wilson at Reams Station, and operating with Early in the Valley, being severely wounded at the battle of Winchester. When Hampton was sent south Lee was given the command of the entire cavalry corps of the army of northern Virginia, conducted the retreat to Appomattox, was one of the council of war whom Robert Lee consulted, and one of the leaders in the last charge of the army of northern Virginia. He “accepted the situation” after the surrender, and went to work on his farm at Richland. From 1886 to 1890 he was governor of Virginia. In 1896 he was appointed consul-general to Cuba, in which position he kept the State Department thoroughly informed of the Spanish policy during the rebellion, and vigorously upheld the rights and interests of the United States; after the destruction of the Maine he did much to prevent the premature outbreak of war with Spain, but when war was inevitable he was recalled. In May 1898 he was appointed major-general of United States volunteers, and assigned to the command of the 7th army corps. At the close of the war he was made military governor of the province of Havana, and later was given the command of the department of the Missouri.

J. W. Jones, D.D.,
President Southern Historical Society.

Lee, Francis Bazley, American lawyer and historical writer: b. Philadelphia 3 Jan. 1869. He was educated at the State Model School in Trenton, N. J., and was graduated from the Wharton School of Political Economy in the University of Pennsylvania in 1890. He was admitted to the New Jersey bar in 1893 and has since practised his profession in Trenton. In addition to various historical monographs relating to New Jersey, he is the author and editor-in-chief of ‘New Jersey as a Colony and a State.’

Lee, Francis Lightfoot, American patriot: b. Stratford, Westmoreland County, Va., 14 Oct. 1734; d. Richmond County, Va., 3 April 1797. He was elected to the Virginia house of burgesses for Loudoun County in 1765, and later represented Richmond County in that assembly. He signed the Westmoreland declaration against the Stamp Act (1765), and on 15 Aug. 1775 became a member of the Continental Congress, where he served until the spring of 1779. On 4 July 1776 he was one of the 56 signers of the Declaration of Independence. He also was a member of the committee that prepared the articles of confederation, and was prominent in debate, particularly on the questions of the Newfoundland fisheries and the navigation of the Mississippi. After his retirement from Congress he served briefly in the Virginia legislature. Consult Sanderson, ‘Lives of the Signers,’ Vol IX. (1827).

Lee, Gerald Stanley, American Congregational clergyman and author: b. Brockton, Mass., 4 Oct. 1861. He was graduated from Middlebury College, Vt., in 1885, and from Yale Divinity School in 1888. He has lectured on literature and the arts, and is the author of ‘About an Old New England Church’ (1893); ‘The Shadow Christ’ (1896); ‘The Lost Art of Reading’ (1902); ‘The Confessions of an Unscientific Mind’ (1902).

Lee, Guy Carleton, American educator and author. He was graduated from Dickinson College, Pa., where he was for a time professor of history. He has since filled other educational posts and has been literary editor of the Baltimore *Sun* from 1901. He is the author of:

‘Hincmar: An Introduction to the Study of the Church in the 9th Century’ (1898); ‘Principles of Public Speaking’ (1899); ‘Historical Jurisprudence’ (1900); ‘Source Book of English History’ (1900); ‘A History of England’ (1901).

Lee, Mrs. Hannah Farnham Sawyer, American novelist and miscellaneous writer: b. Newburyport, Mass., 1780; d. Boston 27 Dec. 1865. She was married to G. G. Lee of Boston. Her works, several of which exerted considerable influence during the second quarter of the 19th century, are: ‘Grace Seymour’ (1835); ‘Three Experiments in Living’ (1838); ‘Elinor Fulton,’ a sequel to the preceding; ‘Rich Enough’; ‘The Huguenots in France and America’ (1842); ‘Stories from Life’ (1849); ‘Memoir of Pierre Toussaint’ (1853); ‘History of Sculpture and Sculptors’; etc.

Lee, Harriet, sister of Sophia Lee (q.v.): b. London 1756; d. Clifton 1 Aug. 1851. In 1786 she published the ‘Errors of Innocence,’ a novel succeeded by several others now forgotten. In 1797–1805 appeared her ‘Canterbury Tales,’ 8 of the 10 tales of which were her own, the others being by her sister Sophia. They enjoyed a great popularity in the early part of the 19th century, and a new edition was published in New York in 1856–7. One of the most remarkable is ‘The German's Tale-Kruitzner,’ from which Lord Byron borrowed not merely the plot and the machinery down to the most trivial incidents, but in some instances the language, of his ‘Werner.’ She also wrote two dramas, the ‘New Peerage’ and the ‘Three Strangers.’

Lee, Henry, American soldier: b. Leesylvania, Westmoreland County, Va., 29 Jan. 1756; d. Cumberland Island, Ga., 25 March 1818. He was graduated from the College of New Jersey in 1774; in 1775 became a captain in Col. Theodoric Bland's legion of Virginia cavalry; and in September 1777 joined Washington's army in Pennsylvania. Promoted major for services in battle (January 1778), he was given command of a partisan corps consisting of two troops of horse, and later increased by a third troop and an infantry company. This corps, which was employed in the annoyance of the British march and camp, was known as «Lee's legion,» and its commander as «Light Horse Harry.» On 19 Aug. 1779 Lee surprised and captured the British post at Paulus Hook (q.v.), N. J. For this achievement, which is regarded as one of the most brilliant exploits of the Revolution, Congress voted him a gold medal. He was promoted lieutenant-colonel, and in the autumn of 1780 was sent to South Carolina to join Greene's army. He covered the American retreat through North Carolina (February 1781), and was involved in some smart skirmishes with Tarleton's dragoons. After Greene had crossed into Virginia, Lee remained in North Carolina to harass the enemy, and, although he could not surprise Tarleton, did defeat 400 loyalists under Col. Pyle. He outfought Tarleton at Guilford Court House (15 March 1781), and with Marion, by cutting Rawdon's line of communication, compelled that officer to abandon Camden (10 May 1781). He took Augusta, Ga. (5 June 1781), and having rejoined Greene, fought with distinction at Eutaw Springs (8 Sept. 1781), and captured some of Rawdon's rear-guard in the British retreat. After having been present at Yorktown, he shortly resigned his commission. In 1785–8 he was a Virginia delegate to the Continental Congress; in 1788 was a member of the Virginia convention for the ratification of the Federal constitution; in 1789–91 sat in the general assembly of the State; and in 1792–5 was governor. In 1794 he was appointed by Washington to command the 15,000 troops sent to suppress the «Whiskey Insurrection» (q.v.) in western Pennsylvania. After service as a representative in the Sixth Congress (1799–1801), he withdrew from public life. In his ‘Funeral Oration upon President Washington,’ pronounced in 1799 before both houses of Congress, occurs the since famous phrase, «First in war, first in peace, first in the hearts of his fellow-citizens.» He wrote ‘Memoirs of the War in the Southern Department of the United States’ (1812), published in revision with a memoir by his son R. E. Lee (q.v.) in 1869.

Lee, Henry Washington, American Protestant Episcopal bishop: b. Hamden, Conn., 26 July 1815; d. Davenport, Iowa, 26 Sept. 1874. He was graduated from Trinity College, Hartford, in 1835; studied theology, and received deacon's orders in 1838. In 1840–8 he was rector at Springfield, Mass., and in the latter year took charge of St. Luke's Church in Rochester, N. Y. In 1854 he was made bishop of Iowa, holding the position till his death; he was one of the founders of Griswold College at Davenport, and was instrumental in obtaining an endowment for his diocese and the erection of the cathedral. He published ‘Manual of Family Prayers,’ and a number of sermons and addresses; also ‘Prayers for Children’ and other books for young people.

Lee, James Wideman, American Methodist clergyman: b. Rockbridge, Ga., 28 Nov. 1849. He was graduated from Emory College, Ga., in 1875; in 1876 was ordained to the ministry of the Methodist Episcopal Church South, and held Georgia pastorates in Carrollton, Dalton, Rome, and Atlanta. In 1893 he went to St. Louis as pastor of St. John's Church; was presiding elder in St. Louis from 1897 to 1901, when he returned to his pastorate at St. John's. In 1894 he was the head of an expedition to Palestine to secure material for the ‘Earthly Footsteps of Christ and His Apostles,’ which he published in 1895 (with J. H. Vincent, q.v.). He has also written: ‘The Making of a Man’ (1892), translated into Japanese and Chinese; ‘Henry W. Grady, Editor, Orator and Man’ (1896); ‘History of Methodism’ (1900); and has edited and illustrated the ‘Self Interpreting Bible.’

Lee, Jennette Barbour Perry, American novelist: b. Bristol, Conn., 10 Nov. 1860. She was graduated from Smith College, Mass., in 1886, was professor of English in the College for Women at Western Reserve University 1893–6, and in the year last named was married to Rev. G. S. Lee (q.v.). She has published: ‘Kate Wetherell’ (1900); ‘A Pillar of Salt’ (1901); ‘The Son of a Fiddler’ (1902).

Lee, Jesse, American Methodist clergyman: b. Prince Edward County, Virginia, 1758; d. September 1816. He was admitted to the Conference as a preacher among the Methodists in 1783, and was chosen as a friend and traveling companion by Francis Asbury. His writings have been the basis of much of the history of early Methodism in America. In 1789 he traveled over New England and preached Methodism from Connecticut to Maine. He formed the first Methodist congregation in New England at Stratfield, Conn., 26 Sept. 1787. In 1792 he preached in Massachusetts, and gathered the first class at Boston 13 July 1792. He was chaplain to Congress during six successive terms. He is known in New England as «The Apostle of Methodism.» He wrote ‹A History of Methodism in America› (1807). Consult: Lee, ‹Life and Times of Jesse Lee› (1848).

Lee, John Doyle. See Mountain Meadow Massacre.

Lee, Luther, American Methodist clergyman: b. Schoharie, N. Y., 30 Nov. 1800; d. Flint, Mich., 13 Dec. 1889. He entered the Genesee Conference in 1827, became an itinerant preacher and a temperance and anti-slavery lecturer, and was several times mobbed on account of his abolitionist sentiments. From 1843 to 1867 he was a member of the Wesleyan body, having as a Wesleyan clergyman been president in 1853 of Michigan Union College at Leoni, and pastor of churches at Syracuse and elsewhere, but in 1867 returned to the Methodist Episcopal denomination. He was the author of ‹Universalism Examined and Exposed› (1836); ‹The Immortality of the Soul› (1850); ‹Slavery Examined in the Light of the Bible› (1855); ‹Elements of Theology› (1856); etc.

Lee, Margaret, American novelist: b. New York 27 Nov. 1841. Among her numerous fictions may be cited ‹Lorimer and Wife› (1881); ‹Divorce› (1882); ‹One Touch of Nature› (1892).

Lee, Mary Catherine Jenkins, American novelist: b. New Bedford, Mass. She has published: ‹A Quaker Girl of Nantucket› (1889); ‹In the Cheering Up Business› (1891); ‹A Soulless Singer› (1895).

Lee, Nathaniel, English dramatic poet: b. Hatfield about 1653; d. London 1692. He was educated at Cambridge, turned his attention to the drama, and in 1675 produced his tragedy of ‹Nero,› and from that time to 1681 produced a tragedy yearly. From 1684 to 1688 he was confined in Bethlehem Hospital on account of insanity, and after his discharge wrote two more tragedies. He is the author of 11 plays, all of which were acted with applause; but his natural fire and pathos were buried in a torrent of words, and clouded by a tendency to turgid and bombastic eloquence. In his play, ‹The Rival Queens› (1677), occurs the oft-quoted line:

> When Greeks joined Greeks then was the tug of war.

Lee, Richard Henry, American patriot: b. Stratford, Westmoreland County, Va., 20 Jan. 1732; d. Chantilly, Va., 19 June 1794. He was educated in England, but returned in 1752 to Virginia, where he soon became prominent in public affairs, and was elected to the house of burgesses. In 1773 he became a member of the committee of correspondence to communicate with the other colonies, and in 1774 was a delegate from Virginia to the first Continental Congress. There he attracted attention by his eloquence, and drafted the petition to the king. In the second Congress he prepared the address to the people of Great Britain. Both of these documents are remarkable state papers. On 7 June 1776 he moved «that these united colonies are and of right ought to be free and independent states; that they are absolved from all allegiance to the British crown; and that all connection between them and the states of Great Britain is and ought to be totally dissolved.» He was in the Virginia legislature in 1780–4, was elected president of Congress in 1784, in 1786 was again a member of the State legislature, and in 1787 also sat in Congress. Upon the adoption of the Federal Constitution, to which he was opposed, he was elected one of the first two senators from Virginia, and there remained, at first as an anti-Federalist, until his resignation in 1792. He was one of the notable orators of his time. Consult: R. H. Lee (his grandson), ‹Life and Correspondence of R. H. Lee› (1825).

Lee, Robert Edward, American soldier: b. Stratford, Westmoreland County, Va., 19 Jan. 1807; d. Lexington, Va., 12 Oct. 1870. His father, Gen. Henry Lee (q.v.), popularly known in the War for Independence as «Light-Horse Harry,» left his home and country, when Robert was only 6 years of age, for a sojourn in the West Indies, on account of his health. After being away nearly five years, he returned, but the march of the fatal disease which had attacked him could not be resisted. When off the coast of Georgia, at his request he was put ashore on Cumberland Island and carried to the home of Mrs. Shaw, a daughter of Nathaniel Greene, his old commander, where he died. Robert never saw his father after he left his home and was only 11 years old when he died.

Observant, respectful and dignified, the youth was reaching out for manhood over a route that might be used as a model for those who followed him. He obtained his early education in good private schools in Alexandria, Va., and being sedate and studious stood high in the estimation of his teachers and was beloved by all his comrades. At 18, the inherited instincts of his nature became aroused and he resolved to be a soldier. A cadetship at the United States Military Academy at West Point was obtained for him by Gen. Andrew Jackson, and the natural bent of his mind was confirmed. To all duties he gave his closest attention; to all studies his profound thought; to all military drills, evolutions, tactics, strategy and commands, his perfect obedience. He became an officer in the Cadet Battalion at the proper time and was the adjutant of his class, when a first classman — a post of honor in a cadet's aspiration. After many who first entered the academy in his class had fallen by the wayside in the various examinations, semi-annually held, 46 still remained to receive graduating diplomas. Lee graduated second in his class without having received a single demerit during his whole course of study, because he conscientiously discharged all the duties confided to him; convinced then as he said many years afterward, that «duty was the most sublime word in the English language.» He was at once commissioned brevet 2d lieutenant and was assigned to the engineers corps, the «Scientific Corps of the Army» as it was called, and won high reputation in that important branch of the service. On 30 June 1831, two years after leaving West Point, he married Mary Custis, daughter of G. W. P. Custis, who was a grandson of Mrs. George Washington, and thus became proprietor of Arlington on the Potomoc and other estates. Five years after, in 1836, he was promoted to 1st lieutenant and two years later, in 1838, was made captain. During the Mexican war, the opportunity was presented for the first time to show the military metal of the engineer officer, and Gen. Scott, when placed in command of the army to invade Mexico, constantly consulted with Lee, acted largely on his advice and mentioned him repeatedly in his official reports. In that campaign he made a reputation superior to all officers of his grade. He surpassed them in personal daring, scientific counsels — a *coup d'œil* of the battle-field — and for felicitous execution of orders. He was brevetted major at Cerro Gordo, 18 April 1847, lieutenant-colonel at Contreras and Churubusco, and colonel at Chapultepec. His veteran commander, Winfield Scott, said that his «success was largely due to the skill, valor and undaunted courage of Robert E. Lee,» and that «if opportunity offered, he would show himself the foremost captain of his time.»

At the close of the Mexican war his services as an engineer were again demanded by the government and he was made a member of the board of engineers of the United States Army, being employed in the construction of forts for harbor defense; 1 Sept. 1852 he was made superintendent of the academy at West Point — a complimentary detail — and the school derived such benefit from his great ability and sagacious administration of its affairs that there was a general desire to retain him. Three years afterward, in 1855, the boundary lines of the United States having been extended, making it difficult to give protection to American citizens on its frontier, two new cavalry regiments were added to the three then in service and Lee was offered the position of lieutenant-colonel of the 2nd cavalry by Jefferson Davis, the secretary of war, and accepted, serving with his regiment at various posts in western Texas and giving very efficient service in protecting the settlers from the depredations of the Comanches and other Indians. Col. Lee was at Arlington on a furlough to settle up the estate of his wife's father, Mr. Custis, when on 16 Oct. 1859, John Brown with a small force marched into Harper's Ferry to liberate slaves and inaugurate war between the whites and the blacks. No one then knew the limit of the aggressive action of Brown, but the War Department knew that an officer of balanced judgment, combined with experience and courage, should represent the government at that point. Lee was selected and he promptly responded to the summons to go to Harper's Ferry. His judicious plans to capture Brown were successful, and his trial, conviction and execution followed. Lee then returned to Washington and in a short time was again on his way to resume his duties in Texas.

Absorbed by the conscientious discharge of his duties, Lee had not noticed the increasing chasm between the northern and southern sections of the Republic, or that the citizens thereof were ranging themselves upon their respective sides. Hoping to the last that the diverging views could be brought together, Lee was at last face to face with the «irrepressible conflict» and could only consider on what side his sword, already famous, should be drawn. «We are between a state of anarchy and civil war. May God avert us from both. I must be patient and wait the end, for I can do nothing to hasten or retard it,» he said. «I cannot anticipate a greater calamity for the country than the dissolution of the Union,» he wrote in 1861. The pleading of the veteran Scott, who said that Lee's services to the Union would be worth to it 50,000 men, and the long friendship of his comrades must be resisted; but beyond all, the command of the army of the United States, offered him by President Lincoln, had to be respectfully set aside. His reply to Mr. Francis Preston Blair, who had been designated to approach him on the subject, is the key to his action. «I declined the offer he made to me to take command of the army that was to be brought into the field, stating as candidly as I could, that though opposed to secession and deprecating war, I could take no part in an invasion of the Southern States.» His inability to accept forced a prompt resignation, which read:

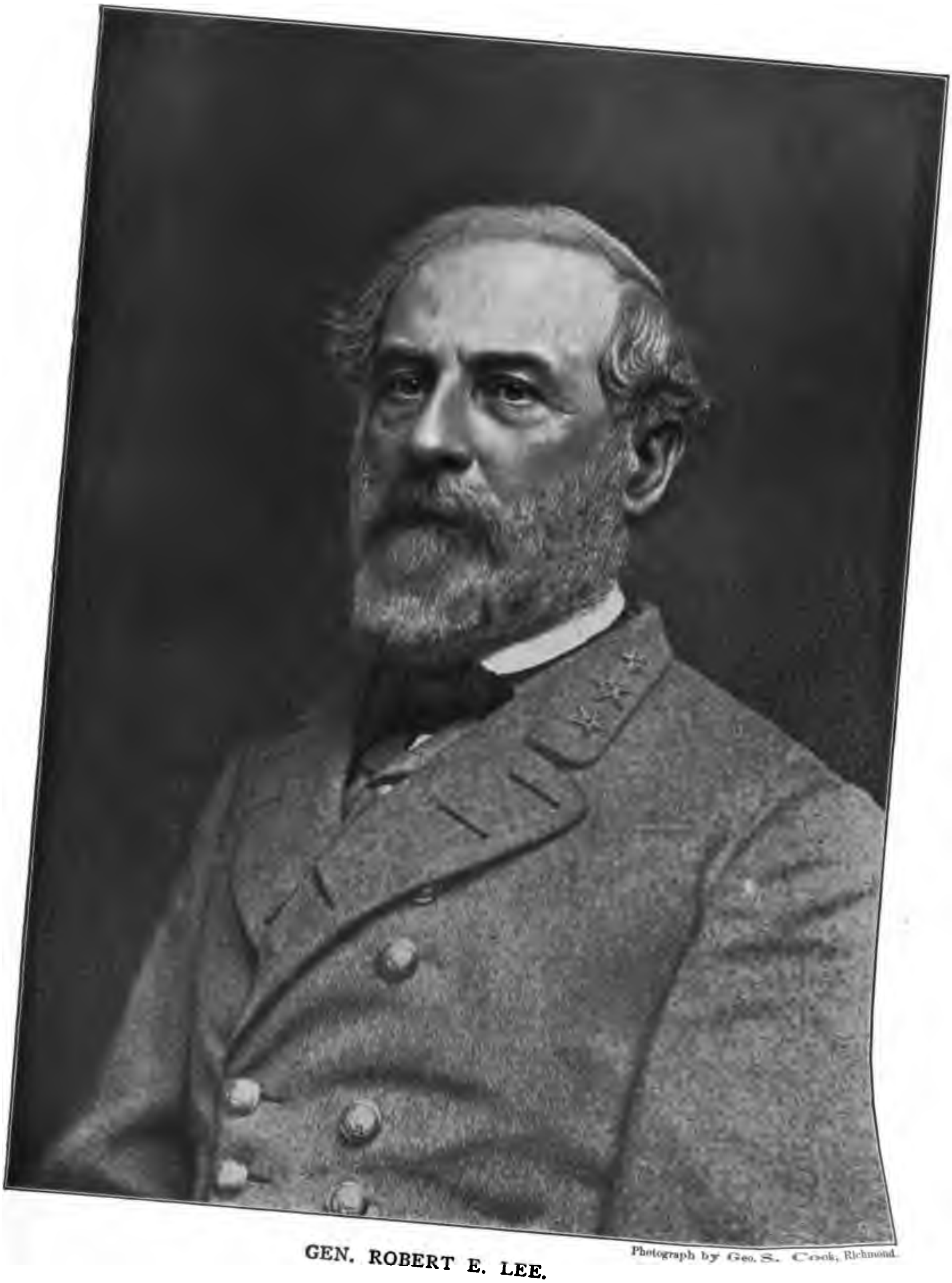
ARLINGTON, WASHINGTON CITY, P. O.,
April 20, 1861.

Honorable Simon Cameron,
Secretary of War.

SIR: — I have the honor to tender the resignation of my commission as colonel of the first regiment of cavalry.

Very respectfully your obedient servant,
R. E. LEE,
Colonel First Cavalry.

Having once decided the question he never faltered in his allegiance or doubted the correctness of his decision. He said to Gen. Wade Hampton in 1869, as they were discussing the war and its results: «I could have taken no other course without dishonor, and if it were all to be gone over again, I should act in precisely the same manner.» Going to Richmond at the request of the Virginia Convention, he was made major-general and commander-in-chief of the Virginia forces, and when Virginia joined the Confederacy he was commissioned in the Confederate service and made one of the five full generals. In July 1861 he took command in Virginia, but the campaign failed through the fault of others and he was severely criticised by the newspapers. He was then put in charge of the sea-coast defenses in South Carolina and Georgia and here his knowledge and practical experience in engineering came into play, for there is little doubt but that the heroic defense which that department afterward made was only possible through his skill and energy in placing it in proper condition. In February 1862 he was made military adviser to President Davis and occupied that position till the wounding of Gen. Johnston at Seven Pines. He quickly demonstrated his power of organization. Everything had to be created — armies organized and the various necessary departments constructed, and on 3 June he was placed in command of the Army of Northern Virginia. He at once determined to drive McClellan from the siege of Richmond. He summoned «Stonewall» Jackson to his aid, collected all the reinforcements he could and on 26 June opened the «Seven Days' Battle,» attacking McClellan's lines on the Chickahominy. Several victories were won and while repulsed in a bloody bat-



GEN. ROBERT E. LEE.

Photograph by Geo. S. Cook, Richmond.

tle at Malvern Hill, where McClellan had made a last stand to save his army, Lee had prepared for a combined attack the next morning, but found that McClellan had retreated during the night under cover of his gunboats at Harrison's Landing, 30 miles below Richmond. He captured 52 pieces of artillery and quantities of stores of all kinds and left McClellan's army in a demoralized condition, and though he had not annihilated it, as he had designed and might have so done but for the failure of some of his subordinates, he had driven it away from Richmond, raised the siege and by a series of maneuvers brought it to pass that McClellan and Gen. Pope, who had taken command of the Army of Virginia, united forces near Washington. Here Lee completely routed Pope, the campaign culminating in the battles on the old field of Manasses on 28, 29 and 30 August and finally drove him to the fortifications in front of Washington (see BULL RUN, SECOND BATTLE OF). Then followed the Maryland campaign, in which Jackson captured Harper's Ferry with 11,000 prisoners and large quantities of arms and stores. At Sharpsburg (Antietam), 17 Sept. 1862, Lee repulsed every attack made by McClellan's well equipped troops and advanced his own lines, only retreating across the Potomoc when he learned that the Union Army had received large reinforcements (see ANTIETAM, BATTLE OF). On 7 November Gen. Burnside superseded McClellan in command of the Union forces and crossing the Rappahannock at Fredericksburg, tried to take the Confederate Army by surprise. Lee, however, had divined his purpose and, occupying a naturally strong position, not only repulsed his attack, but administered a crushing defeat, compelling him to recross the river, where his strong works and heavy artillery rendered him safe from a counter attack by Lee. (See FREDERICKSBURG, BATTLE OF). In February 1863 Hooker succeeded Burnside and was defeated by Lee at Chancellorsville (q.v.). In the Gettysburg campaign of 1863, Winchester was captured by Ewell and at Gettysburg, 1-3 July, Lee faced Gen. Meade, gained a decided victory the first day, gained some ground the second day, but was repulsed with heavy loss on the third day. He remained in line of battle all day the 4th of July and for 9 days at Hagerstown, but Meade did not attack him, and he later retreated into Virginia. In 1864 Gen. Grant was made commander-in-chief of the Union Army, «which was to crush Lee and capture Richmond.» He had 275,000 well equipped and provisioned troops, while Lee had not more than 75,000 men, badly armed, wretchedly equipped and poorly supplied with rations, clothing, ordnance stores and transportation. And yet he outgeneraled and defeated Grant in every battle in that campaign from the Wilderness to Petersburg, from the Rapidan to the lines in front of Richmond, compelling him to camp before Petersburg and remain idle for several months. These great contests against enormous odds are a monument of the strategic and tactical ability of Lee as well as to the courage of his troops. His defense of Richmond and Petersburg alone was a marvelous example of defensive warfare. Now the supply of money was exhausted and the question of feeding the soldiers was daily becoming more troublesome. A discontinuance in the supply of arms and ammunition was imminent. His gallant army had been exposed in a violent campaign to overwhelming numbers and he no longer had «Stonewall» Jackson and J. E. B. Stuart by his side. During the remainder of the year Lee had to guard 40 miles of breastwork with a bare skirmish line and yet meet every move of the enemy, to supply his army, to recruit his thinned ranks from a country already stripped of its men, and to witness the starving out of his army—yet he met and overcame all these obstacles with a resourcefulness which was born of the highest order of military genius. Having been made commander-in-chief of all the Confederate armies in 1865, he determined to unite with Johnston and attack Sherman before Grant could reinforce him, but, on account of the poor condition of the roads and the lack of transportation facilities, Grant forestalled him and attacked his forces under Pickett on his right on 1 and 2 April, at Five Forks, inflicting a crushing defeat and causing him to retreat. Upon reaching Amelia Court House he found that his provisions had been sent in error to the capital, and so being unable to retreat or give battle with any degree of success, after several bloody engagements had been fought, which reduced his infantry to about 8,000 muskets, on 9 April, at Appomattox Court House, the Army of Northern Virginia surrendered. It is a curious fact, that though Lee won all of the battles he fought, with the exception of Sharpsburg and Gettysburg, which were by no means decisive victories for his opponents, yet he lost the cause for which he was fighting. When the time arrived for him to yield to the inevitable and surrender his splendid army, with whose courage and heroism the whole world was familiar, he was greater if possible than ever before. «When you return to your homes,» he said to his troops at Appomattox, «you will take with you the satisfaction that proceeds from the consciousness of duty faithfully performed, and I earnestly pray that our merciful God extend to you his blessing and protection.»

Lee was now a private citizen for the first time in 40 years. He refused lucrative offers from all sides and sections. The legislature of Virginia, desiring to testify its appreciation of his services and character, directed the treasurer of the State to subscribe 100 shares of stock at a par value of $200 in a company organized for the improvement of the navigation of the James River and vest the same in Gen. Lee. He would receive the gift only on condition that he would be permitted to use it for the «education of the poor, particularly the children of such as had fallen in defense of the country,» and he gave his stock to Liberty Hall Academy, in Rockbridge County, Virginia, afterward known as Washington College and now called Washington and Lee University (q.v.). Lee was offered the presidency of the college and at first declined, saying he was «an object of censure to a portion of the country and might draw upon the college a feeling of hostility.» «I think it is the duty of every citizen,» he further added, «in the present condition of the country to do all in his power to aid in the restoration of peace and harmony and in no way to oppose the policy of the State or general government directed to that object.» He finally accepted, however, saying that after what he had written if the board still thought his services would be advantageous to the college and country he would yield to their judgment, and in October 1865 was installed. He continued to refuse highly remunerative positions because he preferred to continue the educational work he had undertaken. At last, however, the labor and exposure of his campaigns and responsibilities attendant to his position as president of the college brought bodily distress. In the spring of 1870 he was persuaded to go South for his health, but the steady progress of the disease could not be checked and his life work rapidly drew to a close. On the evening of 28 Sept. 1870 he was stricken with apoplexy from which he never recovered; he lingered on for a fortnight, breathing his last on the morning of 12 Oct. 1870.

Gen. Lee had for 63 years lived and moved among a people who will cherish his memory through succeeding generations, as long as the sun, moon and stars endure. He was a most remarkable man whether soldier or citizen. From his earliest infancy to the hour of his death he was beloved by all classes — by all people, and the people of his native State of Virginia have recently selected him as one of her two representatives whose statues are to be placed in the rotunda of the capitol at Washington. The great orator and statesman, Benjamin Hill, of Georgia, summed up Lee's character in splendid shape when he said: «He was a foe without hate, a friend without treachery, a soldier without cruelty, and a victim without murmuring. He was a public officer without vices, a private citizen without wrong, a neighbor without reproach, a Christian without hypocrisy, and a man without guilt. He was Cæsar without his ambition, Frederick without his tyranny, Napoleon without his selfishness, and Washington without his reward. He was as obedient to authority as a servant and royal in authority as a king. He was as gentle as a woman in life, pure and modest as a virgin in thought, watchful as a Roman Vestal, submissive to law as Socrates, and grand in battle as Achilles.»

FITZHUGH LEE.

Lee, Sidney, English author and literary editor: b. London 5 Dec. 1859. He was educated at Balliol College, Oxford, was assistant editor 'Dictionary of National Biography,' Vols. I.-II. (1883-90), joint-editor with Leslie Stephen (q.v.) Vols. XXII.-XXVI. (1890-1), and sole editor Vols. XXVII.-LXIII. (1891-1901), and of its Supplement, Vols. LXIV.-LXVI. (1902). To this work he contributed 820 articles. He is the author of 'A Life of William Shakespeare' (1898); 'A Life of Queen Victoria' (1902). In 1903 he delivered a course of Lowell Institute lectures in Boston, Mass., repeating them in other American cities also. These lectures, revised and somewhat extended, were collected in book form entitled 'Great Englishmen of the 16th Century' (1904).

Lee, Sophia, English author: b. London May 1750; d. Clifton, near Bristol, 13 March 1824. She was the eldest daughter of John Lee, an actor. She was the author of a comedy entitled 'The Chapter of Accidents,' brought out at Haymarket Theatre in 1780 with great success. The next year her father died, and she removed with her sisters to Bath, where she devoted the profits of her play to the establishment of a young ladies' seminary over which she and her sister Harriett (q.v.) long presided. She wrote two or three novels and contributed 'The Young Lady's Tale,' and 'The Clergyman's Tale' to the 'Canterbury Tales,' published by herself and her sister.

Lee, Stephen Dill, American soldier: b. Charleston, S. C., 22 Sept. 1833. He was graduated from West Point in 1854; served on the frontiers of Texas, Kansas, and Nebraska; was promoted to the rank of 1st lieutenant in 1856, and served in Florida in 1857. On the secession of South Carolina, he resigned from the United States army, and was made captain of South Carolina volunteers, and gradually rose from this rank to that of lieutenant-general. He was at Seven Pines, at the Seven Days' Battles around Richmond, in the campaign against Pope, and at the second battle of Bull Run. He was placed in command of the forces at Vicksburg, but was succeeded by Gen. Pemberton before the capture of the city by the Federals. After the war he settled at Columbus, Miss., and soon took a prominent part in the affairs of the State. He was elected to the State Senate in 1870, and was a prominent member of the constitutional convention in 1890. In 1880 he was made president of the State Agricultural and Mechanical College at Starkeville, holding this position till 1899, when he became commissioner of the Vicksburg National Park.

Lee, Vernon. See PAGET, VIOLET.

Lee, William, American diplomatic representative: b. Stratford, Va., 1737; d. near Williamsburg, Va., 27 June 1795. He was a brother of Arthur Lee (q.v.), Francis Lightfoot Lee (q.v.), and Richard Henry Lee (q.v.). Prior to the Revolution he was active as a merchant in London; and there he was for a time agent of Virginia colony. In 1777 he became associated with Thomas Morris (q.v.) as superintendent of the commercial affairs of the United States at Nantes, France, and in 1778 was appointed commissioner to Prussia and Austria, but accomplished nothing. A treaty drawn up by him with Neufville, a merchant of Amsterdam, in the year 1778, and approved by the burgomaster of that city, became the avowed cause of the war declared by Great Britain against Holland. Regarding him, consult Wharton, 'Revolutionary Diplomatic Correspondence of the United States' (1889).

Lee Family, The, a family of Virginia, some of whose members have been conspicuous in public affairs at almost every stage of American history. Among all the eminent names of the South there is none that outranks this in the number or prominence of those who represent it in the records of the nation. Sprung from a cavalier line of old and distinguished English stock, the Virginia Lees have continued in the New World that order of Old-World aristocracy — an aristocracy of character and culture, of honor and of public service — which has legitimated itself under the broadening conditions of democratic development, and to which, as well as to the plainer but not less masterful middle-class English element that elsewhere entered into the making of the republic, democracy in the American Commonwealth owes its most essential traits. That Richard Lee who, during the reign of Charles I., brought his large household to Virginia, and himself became the first of this illustrious line in America, brought also to the Northern Neck in Northumberland County, where he settled, an English yeoman's sturdiness raised and enlightened and nowise debilitated by the refinements of gentility. A stout partisan of the Stuart cause, he supported Sir William Berkeley (q.v.) in his resistance to Cromwell's policy, and through this attitude the colonists, threatened by the Protector's fleet, forced its commander into a treaty styling the colony an independent dominion. Lee is said to have joined successfully with Berkeley in having Charles II. proclaimed king in Virginia nearly two years earlier than his final coronation in London. Richard Lee's son Richard and the second Richard's third son, Thomas, were leaders in the colony, Thomas dying just as his governor's commission was made out. By his wife, Hannah Ludwell, he had five sons who became distinguished for public and patriotic acts. Of these, Richard Henry Lee (q.v.), by reason of the diversity and singular efficiency of his services, rendered for many years before the Revolution, during that struggle, and for ten years afterward, to Virginia and all the colonies and later States, stands among the pre-eminent figures of his day. The steps preliminary to the Declaration of Independence can never be recalled without remembrance of him as mover of the resolutions which led to its adoption in the Continental Congress. The address to the people of Great Britain, which he wrote, is perhaps surpassed in weight and loftiness of spirit by no American state paper. His brother, Francis Lightfoot Lee (q.v.) not only was one of the signers of the Declaration, but also made liberal sacrifices for the patriot cause, all the more to be remembered to his honor when it is considered that by temper and education he was fitted rather for the occupations of a student, and for social elegancies, than for the turmoil of politics and the tragedies of war. Arthur Lee (q.v.), youngest son of Thomas, was educated in two professions, medicine and law, and distinguished himself by public services both at home and abroad. As representative of the colonies in Europe during the Revolution, he displayed abilities as a man of learning, versatility, and political sagacity, which he applied in ways highly useful to his country in critical times. William Lee (q.v.), another of the sons of Thomas, also represented the United States in Europe at that period, with less distinction than others of this family attained, but not without some exhibition of their unusual qualities. The fame of Henry Lee (q.v.), the «Light Horse Harry» of the Revolution, unique in several respects, is enduring by reason of his political and military services, while his name is endeared to the American people for his noble eulogy of Washington. As first cousin of Richard Henry and of Arthur Lee, his rights are as valid as theirs in the name to which he adds a lustre in return for that it sheds on him. His son Robert Edward Lee (q.v.) not only stands as a connector of the two great epochs of his country's history — the Revolutionary period and that of the Civil War — but in his life and deeds, too recent to call for special reference here, he worthily perpetuated the fame of the great family whose name he bore, whose blood, whose spirit, whose traditions he inherited. His nephew, Fitzhugh Lee (q.v.), whose name may fittingly close this sketch, still represents in vigorous manhood the typical family stock; and to the varied honors of his predecessors he not only adds his own well-won fame, but joins to that a signal distinction, which he shares with fellow soldiers of the South, as one of those Americans who, in civil and in military life, have proved themselves efficient factors in the final restoration of the Union.

John H. Clifford,
Editorial Staff, ‹Encyclopedia Americana.›

Lee-Hamilton, Eugene, English poet: b. London January 1845. He was educated at Oxford, and entered the diplomatic service in 1869, resigning in 1875. He was for many years an invalid, obliged to maintain a recumbent posture continually. Among his published works are: ‹Poems and Transcripts› (1878); ‹The New Medusa› (1882); ‹Imaginary Sonnets› (1888); ‹The Fountains of Youth› (1891). He is a half-brother of Violet Paget (q.v.), «Vernon Lee,» and married in 1898 the novelist Annie E. Holdsworth (q.v.),

Lee, Mass., town, in Berkshire County; on the Housatonic River, and on the New York, N. H. & H. railroad; about 33 miles northwest of Holyoke, and 13 miles south of Pittsfield. The town includes the villages of South and East Lee. Lee is situated in an agricultural region; but the country is traversed by the southern spurs of the Green Mountains, known as the «Berkshire Hills» in this region. The delightful climate and beautiful scenery make Lee and vicinity favorite summer resorts. The town was settled in 1760 and incorporated in 1777. A fine white marble found in the town is much used for building purposes. The principal manufactures are paper and dairy products. The government of the town is administered by a town meeting or by officials elected at the annual town meeting. Pop. (1900) 3,596. Consult: Hyde and Hyde, ‹Centennial History of Lee.›

Lee-board. See Centre-board.

Lee-Metford Rifle, a military weapon manufactured for the use of the United States navy. It is a gun discharging a steel-jacketed bullet with smokeless powder. The velocity of the bullet is 2,460 feet per second, and the penetration, at the regulation range of 15 feet, is 62 pine boards each seven eighths of an inch in thickness. The pressure on the gun when fired is 60,000 pounds to the square inch. The rifle will kill at over a mile.

Leech, John, English illustrator: b. London 29 Aug. 1817; d. there 29 Oct. 1864. He studied at the Charterhouse School nine years, where Thackeray was his school-fellow; began the study of medicine at St. Bartholomew's Hospital; but soon he gave up his medical studies, and began making drawings. The first of his important works were the illustrations to the ‹Ingoldsby Legends.› He joined the staff of ‹Punch› in 1841. In that field he worked with pre-eminent success, supplying weekly pictures of all sections of English life — scenes of field and forest, of the busy streets, of the rustic cottage and ale-house, and the elegant city dwelling and club; the huntsman, the swell, the injured paterfamilias; the fast young lady and her grave portly mother; the housemaid and her follower, etc., all thrown off with remarkable precision, and showing a steady growth in artistic power. He was buried beside Thackeray in Kensal Green Cemetery. His designs for 'Punch' have nearly all been published separately as 'Pictures of Life and Character' and as 'Pencillings from Punch.' He also executed the Illustrations for 'The Comic History of England,' 'The Comic History of Rome,' and various other books. Consult: Brown, 'John Leech' (1882); Everitt, 'English Caricaturists' (1886); 'Life,' by Frith (1891).

Leech Lake, a body of water in Cass County, Minn.; the largest of the lakes which constitute the head-waters of the Mississippi River. It is about 1,300 feet above the level of the sea; 24 miles long and 15 miles wide. The short stream, which is the direct outlet of the lake and flows into the Mississippi, is called Leech Lake River. On the south and east shores is the Leech Lake Indian Reservation. The country round is well wooded and fish and game are plentiful.

Leeches, highly specialized *Annelida* constituting the order *Hirudinea* or *Discophora.* They are distinguished from most other annelids by the nearly complete obliteration of the cœlom or body-cavity, owing to the development of parenchymatous connective tissue, muscles, etc., the presence of an anterior or oral sucker and a posterior or subanal sucker, and by the absence of setæ, except in *Acanthobdella.* In all leeches which have been carefully studied there are exactly 34 segments or somites, each represented by a ganglion in the central nervous system, and being of smaller size and simpler structure toward the ends than in the middle of the body, where each is divided into from 2 to 12 rings, one of which, sometimes regarded as the first sometimes as the middle ring, bears metameric, eye-like sense organs. Most leeches are temporary parasites, a few nearly permanent parasites; the rest are predatory hunters or scavengers, or they may change from one mode of life to another. They are marine, fresh-water, or terrestrial. The first class is most abundant, both in individuals and species, in cold seas, the second is both temperate and tropical, and the third is confined to warm regions. Four families are distinguished: the *Ichthyobdellidæ* or fish-leeches, the *Glossiphonidæ* or tortoise and snail leeches, the *Herpobdellidæ,* or worm-leeches, and the *Hirudinidæ,* or jawed leeches. The first two families possess a long protrusible proboscis and are much more closely allied than the *Herpobdellidæ* and *Hirudinidæ,* which have no proboscis. The *Ichthyobdellidæ* are chiefly parasitic on fishes and, except a few fresh-water forms, are marine. Some of them, as Branchellion, are branchiate. The *Glossiphonidæ* are richly represented in the fresh-water lakes and streams of North America by a great variety of species, most of which attach themselves to tortoises, whose blood they suck, or else they devour water-snails and small worms. A few are parasitic on fishes. In all of them the oral sucker is small and the eyes in one to four pairs placed near the median line. The *Herpobdellidæ* contains slender, six or eight-eyed, predaceous leeches, which are extremely abundant in fresh-water ponds and feed on small leeches and worms. They have no toothed jaws and the digestive tract is simple and straight. The *Hirudinidæ* have 10 eyes, generally three-toothed jaws and a spacious sacculated digestive tract. Here belong the true blood-sucking leeches, the medicinal leech of Europe, and our native *Macrobdella decora,* also formerly largely employed in this country for blood-letting. The only terrestrial leech of the United States belongs to this family. It inhabits garden soil, feeds on earthworms, and is one of the largest leeches known. Consult: Leuckart and Brandes, 'Parasiten des Menschen'; Whitman, 'Quarterly Journal Microscopical Science' (1886); and Moore, 'Bulletin Illinois State Laboratory of Natural History' (1901).

Leeds, England, a municipal, parliamentary, and county borough and large manufacturing town, in the West Riding of Yorkshire, on the river Aire, 185½ miles north of London. The river, which in passing through the city is spanned by eight bridges, is navigable from its mouth in the Humber, and connects with the Leeds and Liverpool Canal. The town extends for about seven and one half miles from east to west, and about seven from north to south. From the extent of the manufactures the town is naturally smoky, and on the whole its appearance is not prepossessing, although much modern improvement has been effected. The most conspicuous building is the Roman-Corinthian town-hall, considered one of the finest municipal buildings in the kingdom. The greater portion of one wing is allotted to the Free Public Library, to which has been added the Fine Art Gallery. Leeds Infirmary, in the Gothic style, can accommodate 300 patients. Other notable buildings are the new general post-office, in the Renaissance style; the school-board offices, the Royal Exchange, the stock exchange, the Leeds Institute of Science, Art, and Literature; the Yorkshire College, the Grand Theatre, the new Empire Theatre, the grammar-school, the Coliseum (a public hall), etc. Among the places of worship are the parish church of St. Peter's; St. George's, with a tower and spire 160 feet high; Holy Trinity, a fine building in the Early English style; some of the Dissenting places of worship, and the Roman Catholic Church of St. Ann's. The chief educational institution is the Yorkshire College, a branch of the Victoria University (whose headquarters are in Manchester, having taken its origin in Owens College). It comprises two chief departments, a department of science, technology, and arts, including classics, modern languages, history, philosophy, mathematics, physics, chemistry, engincering, etc., and a well-equipped medical department. Other institutions are the Leeds Medical School (1894), Young Men's Christian Institution, a large training college for students for the Wesleyan ministry, and a literary and philosophical society. There is an admirable central library with several branches, the number of volumes being over 200,000. The charitable institutions of Leeds are numerous. Parks have been laid out by the corporation and recreation grounds, the chief being Roundhay Park (two miles from Leeds), 300 acres in extent and containing a lake of 33 acres. The fine ruins of

Kirkstall Abbey (3 miles from Leeds), with the adjacent grounds, presented to the town by Colonel North in 1889, form an attractive resort. The waterworks supply Leeds with water from the Washburn, a tributary of the Wharfe, the daily available supply being 28,000,000 gallons.

Leeds is and has been for generations the chief seat of the woolen manufacture of Yorkshire and has become the seat of other important industries. Chief of these is the wholesale clothing trade, in which several thousand hands are employed, many being also employed in the steel-works, iron-foundries, rolling-mills, tool and machine factories; in the boot and shoe factories and the leather trade. and in the cloth-cap trade, which is also becoming a great branch of industry. There are also locomotive works, tobacco manufactories, color-printing works, extensive chemical and glass works, important works for the making of drainage pipes, fire-bricks, ornamental terra-cotta and pottery ware, etc. One of the great sources of the wealth of Leeds is its abundant supplies of coal and iron. Nearly 100 collieries are worked in the district. The history of Leeds extends over more than 1,200 years, the town being mentioned under the name of Loid or Loidis by the Venerable Bede as the capital of a small British kingdom about 616. It was made a city in 1893, and its mayor was raised to the dignity of lord-mayor in 1897. The vicinity is crowded with villages, most of the inhabitants of which are employed in manufacturing for the Leeds market. Pop. (1901) 428,953.

Leek, a mild European kind of onion (*Allium porrum*), much cultivated for culinary purposes, being often partially blanched by heaping up the earth about the stem. It is used in soups and otherwise, and is the more tender and succulent the richer the soil. The stem is rather tall, and the flowers are disposed in large compact balls, supported on purple peduncles. The leek is a Welsh national emblem. It was well known to the ancient Egyptians, Greeks and Romans. Several species of the genus grow wild in the United States, furnishing the wild leeks, wild onion, field garlic, etc., of the country folks. The cows eat these plants gratefully in the spring, and their milk and butter is tainted in consequence. Compare Garlic.

Lee's Mill, Engagement at. Lee's Mill is a point on the Warwick River, in Virginia, near which occurred the first considerable collision of the Peninsula campaign. The Confederate forces under Gen. Magruder occupied the line of the Warwick, and between Lee's Mill and Wynn's Mill Cobb's brigade threw up intrenchments and constructed redoubts for artillery. On 16 April 1862 Gen. W. F. Smith, with his division of Keyes' corps, was ordered by Gen. McClellan to reconnoitre Cobb's position, stop his work and, if deemed judicious, drive Cobb from it. Brooks' Vermont brigade was thrown forward, and after an artillery fire of more than six hours, part of the time from 18 guns, four companies of the 3d Vermont crossed the stream below a dam and seized the rifle-pits of the 15th North Carolina, but were driven back with severe loss. The effort was renewed later in the day, when, under cover of a heavy artillery fire, which was sharply replied to, detachments of the 4th, 5th, and 6th Vermont endeavored to cross the Warwick, but were driven back. The Union loss during the day was 156 killed and wounded, and 9 missing. The Confederate loss did not exceed 75 killed and wounded. The result confirmed McClellan in his conviction that the line of the Warwick could not be carried by direct assault, and he directed all his efforts to the siege of Yorktown (q.v.). Consult: 'Official Records,' Vol. XI.; Webb, 'The Peninsula'; 'McClellan's Own Story'; Allan, 'History of the Army of Northern Virginia.'

E. A. Carman.

Lee's Surrender. See Farmville.

Leeser, Isaac, American rabbi and journalist: b. Neuenkirchen, Prussia, 12 Dec. 1806; d. Philadelphia 1 Feb. 1868. In his 18th year he removed to Richmond, Va., where he at first engaged in business. In 1829 he became Hazan or minister of Congregation Mikveh Israel of Philadelphia. His first work, 'The Jews and the Mosaic Law,' appeared in 1833, followed in 1837 by his sermons in two volumes. He edited in 1841 'Grace Aguilar's Spirit of Judaism,' and began in 1843 his monthly magazine, 'The Occident,' which he conducted until near the end of its 25th volume. In 1845 he published his Pentateuch in Hebrew and English, and in 1848 his edition of the 'Daily Prayers,' according to the German ritual. Retiring from the ministry in 1850, he issued an English translation of Schwarz's classic 'Geography of Palestine,' and an edition of the Hebrew Bible, with Jaquett. He began now an English translation of the Old Testament, completed in later years. In 1857 he was elected minister of the Beth El Emeth Synagogue, but continued his literary labors, editing 'Dias Letters' (1859); 'The Inquisition and Judaism' (1860); 'Mrs. Hester Rothschild's Meditations and Prayers' (1864); Grace Aguilar's 'Jewish Faith and Spirit of Judaism' (1864). In addition to his work as editor, translator, author and lecturer, he gave the impetus to nearly every Jewish charity in the city, while he suggested institutions that have since been established, so far-sighted was his vision. He was for decades the leader of the conservative party in American Israel and was aggressive and fearless in his opposition to the reform movement, whose progress, however, he could not check.

Leete, William, English colonial governor of Connecticut: b. England 1613; d. 1683. He was destined for the profession of law, and after being called to the bar practised in the Bishop's Court at Cambridge, but attaching himself to the Reformed faith, joined the Puritans who were emigrating in great numbers to America, and reached the western continent in 1637. He made his home in the New Haven Colony in 1639 and became a religious leader in Guilford, which he had helped to found. From 1658 to 1661 he was deputy governor of New Haven. From 1661 to 1662 he was governor, at which latter date the colony was united with Connecticut by royal charter. He was deputy governor of the Colony of Connecticut from 1669 to 1676, when he was appointed governor, a position he held till his death.

Leeuwenhoeck, lā'vĕn-hook, or **Leuwenhoek, Antonius van**, Dutch naturalist: b. Delft 24 Oct. 1632; d. there 26 Aug. 1723. In early life he was engaged in mercantile pursuits, but applied himself during his spare moments to science, and attained the reputation of making the best microscopes in Europe. By his applications of the microscope, and researches in physiology, he attracted the attention of the Royal Society of London; and the greater part of his writings, containing accounts of his discoveries, were published in the English ‘Philosophical Transactions.’ He anticipated in his physiological discoveries much which has been confirmed in modern times. His assertions with regard to the circulation of the blood, the nature of the brain and nerves, and the structure of the crystalline lens, agree very nearly with the results of modern experiment. His investigation of the spermatic animalcules, which he claimed to have discovered in 1677, excited the curiosity of many naturalists, and they were afterward made the subject of much research and of many books by Buffon and others. Leeuwenhoeck's life was passed in scientific research and in manufacturing optical instruments in his native city. His writings were collected and published in Dutch at Delft and Leyden. They also appeared in Latin (1695).

Leeuwin, lā'vĭn or lē'wĭn, **Cape,** the name of the point of land which is the southwestern extremity of Australia. It was named after the vessel Leeuwin, in which were the Dutch navigators who discovered in 1622 this part of the island. The light from the light-house can be seen 20 miles away. The place is subject to severe storms.

Leeward (lū'ạrd or lē'wạrd) **Islands.** See West Indies.

Le Fanu, lė-fä'nü or lĕf'ạ-nū, **Joseph Sheridan,** Irish journalist and novelist: b. Dublin 28 Aug. 1814; d. there 7 Feb. 1873. Having graduated from Trinity College, Dublin, he joined (1837) the staff of the Dublin University Magazine, at first as contributor, and afterward as editor and proprietor. Among modern Irish novelists he stands next in popularity to Charles Lever. ‘The House by the Churchyard’ appeared in 1863, and was succeeded by ‘Uncle Silas’ (1864), his most powerful work; ‘Guy Deverell’ (1865); ‘The Tenants of Malory’ (1867); ‘The Wyvern Mystery’ (1869); ‘In a Glass Darkly’ (1872); etc.

Lefebvre, Jules, zhül lė-fävr, French painter: b. Tournan, Seine-et-Marne, 10 March 1836. He was when a boy apprenticed to the trade of his father who was a baker, but his mother took pains to have him sent to Paris to study art, and he became the pupil of Léon Coignet. His ‘Death of Priam,’ exhibited in the Salon (1851) won for him the Grand Prix de Rome, since which he has gained many medals and honors. His ‘Femme Couchée’ in the Salon of 1868, a nude of singular freshness and power, established his reputation as an artist of the first rank, and the votes of the judges were divided equally between this picture and a painting of Corot's for the medal of honor, which was, however, bestowed on Brion. Among his best-known canvases are: ‘Diana Surprised’ (1879), purchased in the United States for $7,000; ‘Lady Godiva,’ the Countess of Coventry, riding naked through the city — a painting also popularized by many reproductions; ‘Psyche’ (1883), now on exhibition as a loan in the Pennsylvania Academy of Fine Arts; Psyche is represented with a star on her forehead, seated on a rock by the sea, and holding in her hands the fate of the world. ‘La Vérité’ in the Salon of 1870 attracted wide attention, and in recognition of its merits the painter was decorated with the cross of the Legion of Honor. ‘Truth’ is represented as holding aloft to the world a shining mirror. The action is impressive, the lines and proportion of the figure admirable, although the coloring is a little cold. As a painter of ideal heads Lefebvre has become widely popular. His ‘Vittoria Colonna’ is one of the most effective of these. But ‘La Liseuse’ (1889); ‘La Poésie Antique,’ ‘Laure’ and ‘Violetta,’ all exhibit the classic beauty, the repose and exquisite refinement of the ideal school. ‘Clemence Isaure’ is a study which is very human and life-like, the full lips and round chin suggesting physical life and passion while the bay leaves, with which the heavy locks of hair are wreathed, speak of poetic and intellectual power.

Lefebvre is one of the first of living French painters, and his influence is great in the Julien School where he is one of the instructors. Among the romanticists, classicists, realists and impressionists, he stands in the same class as Hector Leroux, Baudry, Bougereau, and Puvis de Chavannes, as an advanced idealist. Yet in opposition to such artists as Courbet, Manet and Bonnat, he is immensely popular, being in his love of ideal beauty and his refined technique, ‘French of the French.’

Lefebvre, or **Le Fevre, Nicolas** or **Nicasius,** chemist, probably a native of France: b. about 1620; d. London 1669. He was educated at the Protestant Academy at Sedan, acquired a knowledge of chemistry and became his majesty's apothecary and distiller. Here Lefebvre found ample opportunity to pursue his favorite study. In 1660 appeared his ‘Traité de la Chimie Théorique et Pratique,’ which went through several editions, and was translated into German. In 1660 he was invited to London by Charles II. to take the post of royal professor and apothecary in ordinary to the household. He was also elected to the Royal Society, which had just been founded. In 1664 appeared a translation into English of his ‘Traité,’ entitled ‘A Compleat Body of Chymistry.’ His treatise on chemistry is compiled, according to his own account, from Van Helmont, Glauber, and Paracelsus, and is divided into the theory and practice of the art. The whole work is very well done, the author shows thorough familiarity with his subject, and his descriptions of apparatus, of substances, and of preparations are clear and systematic. His work served as a model for those of succeeding chemists, especially for that of Glaser, who replaced him in the Jardin des Plantes, and of Lemery.

Lef'ferts, Marshall, American engineer: b. Bedford, Long Island, 1821; d. 1876. After receiving a common school education he took up various occupations, finally settling down in the profession of electrical engineer, which he pursued from 1849 to 1860. During that time he was in the employ of the American Telegraph Company, and consulting engineer to the Atlantic Cable Company. He made many improvements in inventions in the department of electrical transmission while in the service of these companies. During the war he commanded the 7th regiment. In 1867 he became connected with the news department of the Western Union Telegraph Company; two years later, president of the Gold and Stock Telegraph Company, and 1871 he took control of the commercial news department, which had been purchased by that company.

Leff'mann, Henry, American chemist: b. Philadelphia 9 Sept. 1847. He was graduated from Jefferson Medical College in 1869, and from the Pennsylvania College of Dental Surgery in 1884. He was elected assistant professor of chemistry at the Philadelphia Central High School and served from 1876 to 1880. He was port physician 1884–7, and 1891–2, and in 1888 was appointed but not confirmed, coiner United States Mint, political reasons interfering. Since 1888 he has been professor of chemistry at the Women's Medical College of Pennsylvania and professor of chemistry at the Wagner Free Institute of Science. Among his works are: ‘First Steps in Chemical Principles’; ‘Compend of Organic Chemistry’; ‘Compend of Chemistry’; ‘Analysis of Milk and Water Products’; ‘Sanitary Relations of Coal Tar Products’ (from the German); ‘Structual Formulæ for the Use of Students.’ He has edited Reese's ‘Medical Jurisprudence and Toxicology’ (4th and 5th editions), and ‘Allen's Commercial Organic Analysis’ (Vols. I and II., 3d edition).

Legal Education. Instruction in law schools is given by lectures, by recitations from text-books, and by discussion and explanation of selected cases. Each of these systems has its advocates. In a majority of the schools instruction is given mainly by lectures. Next in popularity comes the method of recitations on lessons previously assigned. There are only a few schools that depend mainly on the discussion and explanation of selected cases. Dean Ashley of the New York University Law School writes as follows on this subject: «The leading universities repudiate the idea of any fixed method for teaching or studying law.» Prof. Gray of Harvard says: «In all law schools, I suppose, the students learn from text-books, cases and oral instruction. At any rate they do so here. Each teacher is free to use these means as he pleases. The different professors do actually use them in different ways and proportions.» Dean Keener of Columbia says: «There is no uniform method of instruction in this school. Each instructor is at liberty to pursue the method of instruction which in his opinion will be productive of the best results.» See EDUCATION, PROFESSIONAL, IN AMERICA.

Legal Tender. See FINANCE.

Legal-tender Cases, in American finance, a series of cases before the United States Supreme Court, involving the question whether certain acts of Congress declaring United States notes a legal tender in payment of all debts, public and private, were constitutional. The cases were first argued in December 1867, and decided in November 1869, by a divided court. Five members of the court decided in the affirmative and three dissented. In 1871 after a reorganization of the Supreme Court, the cases were again brought up for argument. Again the court divided, five judges upholding the constitutionality of the act and four dissenting. All the judges agreed that Congress had full power to direct issues of paper money. In 1878 Congress decreed that legal tender notes which had been redeemed or received in the Treasury from any source, should be re-issued and kept in circulation. This latter act was assailed in the courts and the Supreme Court decided, with but one dissenting voice, that Congress had full power to make United States notes a legal tender in the payment of private debts in times of peace as well as in times of war. This decision closed all judicial action upon the subject. Consult: Thayer, ‘Legal Tender’ in Harvard Law Review (1887); Legal Tender Cases (110 U. S. 421, 1884).

Le Gallienne, lĕ găl'lĭ-ĕn, **Richard,** English author: b. Liverpool, England, 20 Jan. 1866. He was educated at Liverpool College and after several years spent in business served as literary critic for the ‘Star’ and settled in London. Since 1902 he has lived in New York. Among his numerous published works are: ‘My Ladies' Sonnets’ (1887); ‘Volumes in Folio’ (1888); ‘George Meredith’ (1890); ‘The Book-Bills of Narcissus’ (1891); ‘English Poems’ (1892); ‘The Religion of a Literary Man’ (1893); ‘Prose Fancies’ (1894–6); ‘Robert Louis Stevenson and Other Poems’ (1895); ‘Retrospective Reviews’ (1896); ‘The Quest of the Golden Girl’ (1896); ‘If I were God’ (1897); ‘The Romance of Zion Chapel,’ a novel (1898); ‘Travels in England’ (1900); ‘Odes from the Divan of Hafiz’ (1903).

Legaré, lā-grē', **Hugh Swinton,** American statesman: b. Charleston, S. C., 2 Jan. 1789; d. Boston, Mass., 20 June 1843. He was graduated at the College of South Carolina in 1814, and subsequently studied at Edinburgh University. After a tour of Europe he returned home in 1820, and two years later entered upon the practice of law. In 1821 he represented his native city in the State legislature, and in 1830 was elected attorney-general. In the same year he established the ‘Southern Review,’ a quarterly, with Stephen Elliott. In 1832 he was appointed *chargé d'affaires* at Brussels. In 1836 he was elected to the lower house of Congress. In 1840 he was appointed by President Tyler attorney-general of the United States. He was a brilliant orator and debater, and his contributions to the New York ‘Review’ on ‘Demosthenes,’ the ‘Origin of Roman Law,’ etc., were marked by much literary ability.

Legate, an ambassador sent by the Pope and armed with his authority to represent him at the court of a foreign prince or state.

Legazpe, Miguel Lopez de, mē-gĕl lō'pāth dā lā-găth'pā, Spanish soldier: b. Zumarraga, Guipuzcoa, about 1510; d. Manila, Luzon, 20 Aug. 1572. He was for several years chief secretary of the government of the City of Mexico and in 1564 was made commander of the Spanish forces sent to the Philippine Islands. He sailed from La Navidad, Mexico, in November 1564, and reached the islands in the following February. He took possession of several of the islands and founded San Miguel in Cebu, in May 1565; began the subjugation of Luzon in 1570, and founded the city of Manila in May of the next year.

Legend, originally a term applied to collections of biographies of saints and martyrs, or of remarkable stories relating to them. In the

Middle Ages a collection of the lives of the saints was known by the name of Legenda Sanctorum, or Historia Lombardica. There is a celebrated collection, called the Golden Legend (Aurea Legenda), by Jacobus de Voragine, archbishop of Genoa, who died in the year 1298. It was translated into English by Caxton, and printed by him at the command of William, earl of Arundel, in 1483. Many of the mediæval legends were of an uncritical character, and along with true history often mingled much fable. In the course of time the legend came to mean only the fictitious parts of the story and became distinct from authentic history. It has now come to mean any unauthentic or improbable story handed down from ancient times. Legend is also used for the motto or words engraved in a circular manner round the head or other figure upon a medal or coin. The meaning of this term is similar to that of *inscription;* but the latter refers chiefly to the writing placed in the middle of the coin, while the legend surrounds it.

Legendre, Adrien Marie, ā-drē-ŏṅ mā-rē lė-zhŏṅdr, French mathematician: b. Paris 18 Sept. 1752; d. Auteuil, France, 9 Jan. 1833. He was professor of mathematics in the military school at Paris and in 1783 became a member of the Academy. He was in 1787 employed by the French government with Cassini and Mechain, to measure a degree of latitude between Dunkirk and Boulogne, while English mathematicians did the same on the other side of the Channel, in order to determine the precise location of the observatories of Greenwich and Paris. In 1808 Legendre was appointed by the imperial government councillor for life to the university. He particularly distinguished himself by profound investigations as to the attraction of elliptical spheroids, and his method of calculating the course of the comets attracted great attention. His best known work is ‹Eléments de Géometrie› (1794; new edition, with additions and modifications by Blanchet 1845), which has been translated into English with notes by Sir David Brewster. He wrote also: ‹Essai sur la Théorie des Nombres› (1798); ‹Nouvelle Methode pour déterminer l'Orbite des Cometes› (1805); ‹Exercises du Calcul integral, sur divers Ordres de Transcendantes et sur les Quadratures› (1811–19); ‹Traité des Fonctions elliptiques et des Intégrales eulériennes› (1827–32); etc.

Leger, Paul Louis, pōl loo-ē lā-zhā, French scholar and author: b. Toulouse 13 Jan. 1843. In 1885 he was appointed professor of the Slav languages at the Collège de France, and has done much to awaken an interest in the history and philology of the Slav peoples by such works as: ‹Slav Studies› (1875); ‹History of Austria-Hungary› (1878), translated into English; ‹Slav Tales› (1882); ‹The Save, Danube, and Balkan› (1884); ‹Bulgaria› (1885); ‹Russians and Slavs› (1890); ‹Russian Literature› (1892).

Legerdemain, lĕj-ėr-de-mān', the art of performing tricks, or deceiving the human eye with apparent supernatural power. Legerdemain is usually carried on successfully by the aid of trick apparatus and machinery. Sorcery, enchantment, magic, necromacy, divination and perhaps astrology are in a sense all branches of legerdemain. For further details see MAGIC.

Leggett, lĕg'ĕt, **Mortimer Dormer,** American soldier: b. Ithaca, N. Y., 19 April 1821; d. Cleveland, Ohio, 7 Jan. 1896. After graduating in medicine at Willoughby, Ohio, he studied law and was admitted to the bar in 1845. In the following year he was instrumental in organizing the first union free school system in Ohio. He was professor of pleadings and practices in Ohio Law College 1855–8, superintendent of the Zanesville (Ohio) public schools in 1858–62, and from 1862–5 served in the Federal army and was promoted to be major-general of volunteers in August 1865. From 1881 till his death he practised in Cleveland, Ohio.

Leggett, William, American journalist: b. New York 1802; d. New Rochelle, N. Y., 29 May 1839. He was educated at the college in Georgetown, D. C., and in 1822 entered the navy as midshipman, but resigned in 1826. He had in the previous year published a volume of poems, ‹Leisure Hours at Sea, by a Midshipman of the U. S. Navy,› and in 1828 became editor of the ‹Critic,› a weekly literary journal, soon unitel with the ‹New York Mirror,› to which he contributed ‹Tales by a Country Schoolmaster› and ‹Sketches at Sea.› In 1829 he became one of the editors of the New York *Evening Post,* to which journal he was attached until 1836. He then commenced a weekly journal called the ‹Plaindealer,› which attained a large circulation, but was soon discontinued through the failure of its publisher. In May 1839, he was appointed by President Van Buren diplomatic agent to Guatemala, but died suddenly while preparing for his departure. His ‹Political Writings,› with memoir by Theodore Sedgwick, appeared in 1840. Leggett was remarkable among the journalists of his day as an unflinching advocate of freedom of opinion for his political opponents as well as for the men of his own party.

Leggett's, or **Bald, Hill, Battle of,** an engagement of the Civil War, near Atlanta, Ga. The battle of Peachtree Creek (q.v.), 20 July 1864, was a Confederate defeat. On the 21st Gen. Sherman advanced strong skirmish-lines to within about two miles of the works surrounding Atlanta. In the morning Leggett's division was ordered to carry a high, bare hill, situated about half a mile south of the Decatur railroad. Supported on the right by Giles A. Smith's division, Leggett advanced under cover of the hill itself, dashed forward when reaching its base, drove Cleburne's Confederates from it, and began to intrench. The Confederates made several vain efforts to retake it. From its summit Atlanta was in full view. Discovering at daybreak of the 22d that the advanced Confederate works had been abandoned, Sherman ordered a general advance along his line to occupy the city, and the movement began accordingly. During the night, however, the Confederate Gen. Hood had abandoned his advanced lines on the left and ordered Hardee's corps of four divisions to march entirely past Sherman's left and attack his left and rear. Giles A. Smith's division of Blair's Seventeenth corps held Sherman's left and Dodge's Sixteenth corps was some distance in rear of the centre of Blair's corps, and perpendicular to it. Blair fronted west, Dodge south.

About midnight Hardee moved out of Atlanta by the McDonough road, and about daybreak, when the troops had made a night march of 15 miles, and passed beyond Sherman's left, he halted, formed line, and gave his men needed rest. In half an hour the order was given to advance, and his corps went forward until Bates and Walther's divisions came to open ground, where they received a most deadly fire from Dodge's two Union divisions, which held them in check. Every effort to advance was repulsed with great loss, and Gen. Walther was killed. On the Federal side Gen. J. B. McPherson (q.v.), commanding the Army of the Tennessee, hastened troops to fill an interval between Dodge and Blair, rode to Dodge, and then toward Blair's line, and had gone but a short distance when he fell mortally wounded, being succeeded in command by Gen. John A. Logan. Meanwhile the left of Hardee's line had enveloped Giles A. Smith's division, attacking it in front, flank, and rear, Smith gradually yielding ground and refusing to connect his left with Dodge's right, the Confederates gradually advancing to the foot of Leggett's Hill. When Hardee's attack on Sherman's left and rear was being delivered, Hood ordered Cheatham's corps to attack in front, and the attack fell upon Leggett's Hill and the Fifteenth corps on the right of it, just as Leggett had repulsed an attack in his rear. Leggett, by desperate fighting, held his ground. The Confederates made repeated attacks until nightfall, when Hardee withdrew his right wing, leaving his left connected with the intrenched line in front of Atlanta. On the right of Logan's corps the Army of the Ohio was attacked by Smith's Georgia militia, which was readily repulsed. On Hardee's right Wheeler's cavalry attacked Sprague's brigade in Decatur, and for a time pressed it vigorously, but Reilly's brigade of the Army of the Ohio coming to its assistance, Wheeler was repulsed. The battle of Leggett's or Bald Hill was one of the greatest of Sherman's Atlanta campaign, and involved four corps of his army and two of Hood's. The loss of the Army of the Tennessee was 430 killed, 1,559 wounded, and 1,733 missing, with 10 guns; the entire Union loss during the day was about 4,000. The Confederate loss is not known; it has been variously estimated at from 6,000 to 10,000; it was probably between 5,000 and 6,000. Consult: ‘Official Records,’ Vol. XXXVIII.; Cox, ‘Atlanta’; Sherman, ‘Personal Memoirs,’ Vol. II.; The Century Company's ‘Battles and Leaders of the Civil War,’ Vol. IV.

E. A. Carman.

Leghorn, lĕg'hôrn or lĕg-hôrn′ (It. Livorno, lē-vōr′nō), Italy, a walled city and a seaport, in Tuscany, on the Mediterranean. It is the capital of the province of Leghorn. It is about 200 miles northwest of Rome and 60 miles west of Florence. It is a well built and clean city; the north part called Venezia Nuova, is intersected by canals along which are warehouses and stores. Leghorn has an inner and outer harbor and a good roadstead. Neither harbor will accommodate the largest vessels. In the outer harbor is a lighthouse, built in 1303. Some of the manufactures are straw hats (originally the famous Leghorn hats), leather, woolen caps, glass, paper, soap, coral ornaments, etc. Shipbuilding is one of its important industries. The chief exports are olive oil, borax, wine, marble, quicksilver, candied fruit, hemp, hides, soap, raw silk, etc. The chief imports are sugar, cotton, coal, tobacco, grain, spirits, and petroleum. In the middle of the 16th century Leghorn had less than 800 inhabitants; but about this time it became a free port, the first one on the Mediterranean. After the decay of Porto Risano, a neighboring city, Leghorn grew into importance. Many of its ancient churches and dwellings are now in a good state of preservation, and are visited annually by many tourists. Some of the educational institutions are the Royal Commercial Marine Institute, the Royal Marine Academy, a library with over 60,000 volumes, a number of academies and seminaries. There are many charitable institutions for the sick and the poor, and for orphans. Leghorn is a popular summer resort, and its connection by electric lines with the bathing places and with beautiful villages in the vicinity make it a most desirable place of residence at any season of the year. Pop. (1901) 98,321.

Leghorn, a breed of domestic fowls. See Poultry.

Leghorn Hats, hats made in Tuscany from straw-plait obtained from bearded wheat cut green and bleached. They are so called because imported from Leghorn.

Legion, in ancient Roman armies, a body of infantry consisting of different numbers of men at different periods, from 3,000 to above 6,000, often with a complement of cavalry. Each legion was divided into 10 cohorts, each cohort into three maniples, and each maniple into two centuries. Every legion had 60 centurions, and the same number of optiones or lieutenants and standard-bearers. The standard of the legion was an eagle.

Legion of Honor (*Légion d'Honneur*), a French order for the recognition of military and civil merit, instituted by Napoleon while consul 19 May 1802, and inaugurated 14 July 1804. The decoration originally consisted of a star containing the portrait of Napoleon surrounded by a wreath of oak and laurel, with the legend, ‘Napoléon Empereur des Français’; on the reverse was the French eagle with a thunderbolt in his talons, and the legend, ‘Honneur et Patrie.’ The order has been remodeled several times. There are now five ranks or classes: ordinary chevaliers or knights, officers, commanders, grand-officers, grand-crosses. The profuse granting of the decoration of the order latterly brought the institution into discredit, and the number of chevaliers is now restricted to 25,000, the officers to 4,000, the commanders to 1,000, the grand-officers to 200, and the grand-crosses to 70. The star now bears a figure emblematic of the republic, with the inscription, ‘République Française 1870,’ on the reverse two flags, with the inscription, ‘Honneur et Patrie.’

Legislation, or **Law-making**, a subject which naturally divides into four branches: the nature of its sanctions, or in other words the body from which it emanates; the methods of preparing and enacting it; classification by its subjects, as organic, general, special, or local; and by its objects, as substantive or constructive, and remedial or punitive.

1. The final sanction of any law must be the major part of the organizable force in a com-

munity; since a law without force to compel obedience is mere counsel from an advisory body or the expression of an opinion, *brutum fulmen.* But the source which promulgates it need not be, as in modern states it usually is, an expressly constituted legislative body. The law may be an edict from a monarch; or a decree from an administrative council; or (as with State constitutions in general) the work of a popular convention, itself now usually called by a legislative body, but originally (see Convention) the expression of the popular will through its leaders, not disowned by the people; or by judges who practically make new legislation by construing the old. A broad distinction between the United States and the continent of Europe in this respect is, that in the constitutional governments of the former, a large part of the work which loads the State and national legislatures here is done by administrative orders with the force of law. Each minister in the great departments of state promulgates executive decrees, of a sort which are classed as legislation and taken charge of by legislatures here (to the exhaustion of their time and energies needed for broader care over the public interests): city charters and county and town governmental regulations are there counted as administration, not legislation.

2. When entrusted to regular legislative bodies, the methods of imposing it on the community are practically divided into two, corresponding to Mr. Bagehot's classical division of governments into cabinet and presidential; or still more accurately, the difference as legislative bodies is between one supreme committee and an aristocracy of theoretically equal committees, of which some are grandees (see Congress). In the former, the grand parliamentary committee called the cabinet initiates nearly all legislation, of its own motion or by adoption of outside proposals; shapes it under fire of discussion (in which the ministers take part), and dictates when it shall be voted on; and stands or falls with the general success of its measures. In the second or congressional method, also used in the State legislatures, each member introduces whatever bills he chooses; they are referred to committees, standing or special, who report and make recommendations on them (or not) at will, and those interested in their passage secure a vote when and if they can. The immense mass of projected legislation poured into legislatures under our system compels the most rigid rules as to all the stages of this process,—form, presentation, reference, readings, record, motions, balloting or ayes and noes, etc. In practically all our States the executive has a qualified veto on legislation (see Executive). Much in favor now is the Referendum (q.v.), which throws the final responsibility on the people; but in no case have the results justified any confidence in it as an improvement.

3. Organic laws are those which form the working basis of an independent (or locally autonomous) community, assign rights and duties of sovereign and subject, distribute and delegate powers. These form the source of authority for all the working bodies which put into effect the organic provisions; to them, therefore, must be referred all questions as to the scope of their delegated powers, by legislatures and executive bodies. All that contravenes this organic law is “unconstitutional.” From its fundamental and far-reaching nature, it is always made difficult of change; and for the same reason, incessant and too often successful efforts are made, by over-zealous reformers, to foist into them all sorts of legislative measures so opposed to the wishes of a large section that speedy repeal is feared if not so intrenched. General legislation is that which affects the interest of the whole community, or if it practically affects special sections, does so by the chance of localized interests. The rules which should guide this are outside our province. Local legislation, that relating to particular municipalities or other State subdivisions, blends so indistinguishably with special legislation—that relating to specific individuals, companies, interests, etc.—that the evils are one, and the attempted restraints are of one sort. The latter (special) is of course far the most fertile source of direct pecuniary corruption, and much more abundant; but the “hold-ups” of municipal interests, or laws interfering with their government or finance, etc., have been and remain great sources of corruption also, for large money interests are often affected by them. So great have been the evils of this that many States have amended their constitutions to prohibit or restrain it; but in the case of municipalities, this is regularly, though with more than doubtful constitutionality, evaded by dividing a State into “classes,” with but one in each class, and passing laws for the class. Special legislation for individuals or corporations can only cease with the abdication of legislative power over business; and the attempt to forbid it results in the worst class of it,—namely, the modification of general law to suit special intefests.

4. Substantive or constructive legislation is that creating or defining rights and duties, or assigning powers; with this must always go, to make it a law, the provision of a penalty for disobedience, or at least a provision for enforcing obedience which implies the imposition of penalties already legal. The command or the permission to do something, in fact, implies a menace in case it is not done or the permission is interfered with. Destructive or amendatory law is the abolition of former laws; and a large part of the work of every legislature consists in undoing the work of its predecessors. But as this involves either passing others instead, or leaving in force still others, if nothing but the common law,—a mixture of legislature-made and judge-made legislation,—it belongs to the constructive order, paradoxical as it seems. Remedial legislation provides protection or remedies for wrong; this too needs its punitive accompaniment to be of any effect.

Legislature, in the United States, the law-making body of one of the States; in general, the law-making body of any constitutional state. The name always implies that there is not an autocracy promulgating self-validated decrees, but a body of representative citizens, who act for the entire citizenship in framing or consenting to their laws. It has been stated under Legislation that laws need not emanate from an express legislative body; but in some shape all free modern states have such a body. The subject divides into four chief branches: (1) The origin and history of the body, and the general outcome; (2) the legal sources of its power and the methods of selecting it; (3) the extent and limits of its powers, its methods, and its periods; (4) the qualifications, tenure, and rights of its members. The first and second intertwine.

1. The original legislative bodies, like the Greek ecclesia and the Roman senate, were executive and administrative bodies also; public business was not yet differentiated. Under the empire, as the imperial power grew and the senatorial dwindled, legislation was confined to codes promulgated by the emperors, plus judge-made law. In the mediæval states, the king or prince was generally the fountain of legislation; but the Teutonic assembly, representing popular co-operation, survived in the favorable location of England, as the Witenagemot of the Saxon kingdoms. The Norman and Angevin kings replaced them with a council of leading nobles and clergy; but in the struggles with Henry III., Simon de Montfort called in the representatives of the towns. His system perished with him; but Edward I. revived it, for the sentiments of the chief sources of the royal supplies could not be disregarded. After asserting a check on one administrative department after another, the popular body wrested from the privileged orders first a share in and finally a monopoly of legislative action. The inviolability of its members, long claimed, was established against the Stuarts; the right to decide on the qualifications of its members was established against George III. by the Wilkes case. The separation of executive, judicial, and legislative functions, involved in this process,—since a representative body in a great state is unfit for the first two, though in the little Greek city-states they were combined,—had become a fixed principle of English public life by the 18th century, and was transferred to the English colonial governments. That nearly all had two chambers was due to the accident of the English parliament having that constitution; they were not due to the theory of «checks and balances,» which on the contrary was evolved from the working of the parliamentary system. This system, nevertheless, commends itself by reason and experience, to prevent hasty or factious legislation, especially from great waves of popular feeling; and is used in nearly all legislative bodies. In part, this is because all other parliamentary systems, as the countries have emerged from absolutism or dependence and undertaken constitutional life, have been copied from those of England or the United States. This copying extends to all the general forms, and often mimics unessential details under entirely different circumstances from those which generate the originals. Thus, not only in the Congress but even more needlessly in the State legislatures, the lower house only (see HOUSE OF REPRESENTATIVES) can originate money bills; though both houses are equally popular bodies, and the English provision was part of a warfare between nobles and commons. The upper or less numerous house is also usually invested with the confirmation of treaties and appointments, and sometimes with some administrative functions; in the Congress the House prefers impeachments and the Senate tries them, and the States have copied this.

2. The old legislatures represented «estates» or orders of the state, the three great ones being nobles, clergy, and commons. The English parliament still does so, except that the first two are merged in one house and vote as one, instead of separately as formerly. In essence this is the obvious and proper form of representation (by the great classes of interests and sympathies); but in a country where there are no classes, there is but one to represent, the whole people, and universal suffrage with popularly nominated candidates is the only workable method. Even where there are such, this method is general for the lower houses; but efforts are almost everywhere made to restrict the body of electors somewhat, and bar out the most ignorant, dangerous, or corruptible class. Property-holding or tax-paying are common, and educational requirements are much used, but not always for their avowed objects. The upper houses are sometimes chosen directly, as in the United States of Mexico and Brazil, but from larger districts than the lower, sometimes at large; sometimes indirectly, as in the United States and France; sometimes appointed, as in Germany, Switzerland, and Canada. In still others, it is neither elective nor appointive, but a mixture of hereditary and *ex officio*, or both, as in Great Britain and Austria-Hungary; sometimes a mixture of hereditary and elective, as in Prussia; sometimes of hereditary and appointive, as in Italy.

3. Legislatures may be divided according to their powers, into limited and omnipotent. The United States is the chief exemplar of the former; Great Britain and France represent the latter. Not only the State legislatures, but Congress, are limited to passing such laws as do not conflict with the Constitution, as interpreted by the Supreme Court; the States are still further bound by their State constitutions; and in both, President or governor can compel a reconsideration and a heavier majority. The enactments of most European parliaments are substantive law as soon as passed, with no superior authority; the English sovereign has a theoretical veto which he cannot use, the French president has none. In methods, all legislatures are hedged in by a great body of rules of their own making, found needful by experience; the choice and powers of the speaker, the appointment of committees, the method of introducing and acting on bills, the regulation of debate, the communication between the two branches and between either and the executive, the treatment of petitions, and many other matters, cannot be left to continual warfare. These rules are of great number and complexity, and throw the control of business entirely into the hands of experts (see CONGRESS): it has been said that a member of Congress needs an entire session to learn the rules sufficiently to take any effective part, and much of the time of all is spent in debating their application. A very important limitation is that on the freedom of debate by the American «previous question,» French *clôture*, English «closure,» in other governments «urgency of public business»—all are the same, and nearly all popular parliamentary bodies have been compelled to adopt it; the United States Senate being a conspicuous exception, and Great Britain a late and reluctant accession. Without it, the entire system of «government by discussion» may be made unworkable by a small knot of members playing tricks with the rules; with it free debate may be stifled, but the evil is the less of the two. Procedure must be open, save in «executive sessions» to make appointments. The matter of a quorum is settled by each for

itself, usually as a majority of the elected members; each also decides what shall constitute a majority vote, whether of members elected or members present. The former power of many legislatures to dissolve themselves has been everywhere restrained: in the States by limitation of term and of the frequency and length of sessions (usually now to biennial sessions, and often to 60 days, on a rather ludicrous theory); in Great Britain by limiting the length of a Parliament to seven years. The upper house in Congress and most States is made a continuing body, by so arranging the terms that only a part are elected on any one occasion.

4. The qualifications for the lower house are invariably citizenship; usually (though with growing exceptions) male sex; an age generally (though not always) higher than the voting age, usually 25, sometimes more; if a State of the Union, technical residence therein, and, by a custom with the force of law, residence in the district of election. Crime and pauperism are invariable disqualifications, and sometimes bankruptcy. The upper house in addition to these has almost invariably (except in the United States) a higher age limit, from 30 up to 40; often a property qualification; and when appointive, they are almost invariably from the upper business or professional ranks. The tenures are always much longer in the upper house than the lower: nowhere less than six years, nine in some, for life in many European states — save that in Germany and Switzerland they can be terminated at the will of the local governments that make the appointments. In the lower house it is from a minimum of one to a maximum of three, except in Great Britain, where it is for seven unless the Parliament is sooner dissolved. In all legislatures, the members are exempt from civil process while in actual session, even during journeys to and from home at recesses.

Légitime, François Denys, frăṅ-swä dĕ-nē lā-zhē-tēm, Haitian general: b. 1842. During the administration of President Salomon, he was accused of aspiring to the presidency, and accordingly went to Kingston, Jamaica, remaining three years, then returned to Haiti at the invitation of his followers, and on 7 Oct. 1888 was elected president of the provisionary government. Gen. Thélémaque denounced the election as a job, and attempted to make himself president, but he was killed in the battle which ensued. Légitime was elected president of Haiti 17 Dec. 1888, but resigned in 1889, owing to the opposition of Gen. Hippolyte, and again retired to Jamaica. In 1896 President Sam granted a general amnesty, and he returned to Haiti.

Legouvé, Gabriel Ernest Wilfrid, gä-brē-ĕl ėr-nā vēl-frĭd lė-goo-vä, French dramatist and miscellaneous writer: b. Paris 15 Feb. 1807; d. 14 March 1903. In 1827 he won a prize of the Academy with a poem on the art of printing, ‹Découverte de l'Imprimerie.› While instructor in the Collège de France 1847, he lectured on the history of woman's development; and later published: ‹Moral History of Women› (7th ed. 1882), and ‹Woman in France in the 19th Century› (1864). These works were received with great favor, and were followed by ‹Science of the Family› (1867), and ‹Messieurs the Young Folk› (1868). Meanwhile Legouvé was winning high distinction as a playwright with ‹Louise de Lignerolles›; ‹Adrienne Lecouvreur› with Scribe (1849); ‹Medea›; ‹By Right of Conquest›; ‹Miss Suzanne› (1867); ‹Anne de Kerwiler› (1879); ‹Consideration›; etc. In 1882 he published: ‹Recollections of Sixty Years,› and in 1890 ‹Winter Flower, Winter Fruits: Story of my Household.› In 1885 he became a member of the French Academy.

Legros, lĕ-grō', **Alphonse,** Anglo-French artist: b. Dijon, France, 8 May 1837. In 1857 he exhibited for the first time in the Salon, but finding small encouragement in France he removed to London in 1863, became a naturalized Englishman, and was appointed in 1876 professor at the Slade School in University College. His work, alike in painting, etching, and modeling, is strongly mannered, and as a colorist his range is somewhat limited. His more important pictures are the ‹Anglers,› the ‹Pilgrimage,› the ‹Spanish Cloister,› the ‹Benediction of the Sea,› the ‹Baptism,› and the ‹Coppersmith.› His etchings will prove in all probability his most enduring work, among the most noteworthy being his ‹Death and the Woodman,› and ‹Le Repas des Pauvres,› both marked by a fine breadth in conception and handling. His portraits are also of value.

Legu'min, or vegetable casein, a protein substance analogous to the casein of milk, obtained from beans, pease, lentils, vetches, and other leguminous seeds; the principle of the *Leguminosæ.*

Legumino'sæ, a natural order of herbs, shrubs, and trees widely distributed in all climates but most numerous in tropical and subtropical regions; growing upon all kinds of soil; exhibiting a great range of habit from creeping annual to climbing shrub; useful for a great variety of purposes — ornament, food, timber, fodder, and in the arts; and constituting the second largest family of plants, about 7,000 species distributed among about 450 genera. The species are characterized by alternate, stipulate, usually compound leaves; papilionaceous or sometimes regular flowers commonly arranged in racemes; monadelphous, diadelphous or occasionally distinct stamens, typically 10, surrounding a single simple pistil which generally becomes a pod or legume containing one to many seeds.

The species naturally fall into three suborders; (1) *Papilionaceæ,* with flowers resembling a butterfly; (2) *Cæsalpineæ,* with imperfectly or not at all papilionaceous corollas, which may sometimes be nearly regular; (3) *Mimosæ,* with small, regular flowers. The first group contains more than two thirds of the species. Its members are adapted for insect fertilization, especially by bees, which alight upon the lower petals, brush against the pistil which is thrust out by the insect's weight, then come in contact with the stamens and finally carry the pollen, which has been discharged, to other flowers. Thus the pistils receive pollen from stamens not in the same flower with them. In some instances they may also obtain pollen from these stamens, thus having a double chance to be fertilized. (See FLOWERS AND INSECTS.)

Perhaps the most interesting trait found in the order is the power possessed by the species of obtaining free nitrogen from the air by means of the tubercles or wart-like excrescences upon their roots. These tubercles are the homes of bacteria which have gained entrance to the plant's tissue through the root-hairs; and are thus the result of irritation. The plants, it is believed, furnish the bacteria with carbohydrate food in return for the nitrogenous material prepared by them, thus exhibiting excellent examples of symbiosis (q.v.). Largely owing to this reciprocal action the legumes are valued as green manures, a fact long acted upon but unexplained until the last quarter of the 19th century, when Hellriegel and other investigators proved it, and even went further to show that soils poor in the bacteria could be inoculated profitably. See CLOVER; NITROGEN; ROOT-TUBERCLES; GREEN MANURING; VETCH; COW-PEA; BEAN; LUPINE; ACACIA; LICORICE; INDIGO; SWEET PEA; MEDIC; LABURNUM; TAMARIND; MIMOSA.

Lehigh, lē'hī, a river of Pennsylvania which has its rise east of Wilkesbarre, in Luzerne County, and flows nearly south to a point about 12 miles below Mauch Chunk, where it breaks through the Blue Ridge. From here its course is southeast to Allentown, then northeast to Easton, where it enters the Delaware River, after a course of about 120 miles. In its upper course it is a rapid and picturesque mountain stream, broken by several falls. It passes through a rich coal and iron ore region, and serves as an outlet for the products of the mines. It was made navigable by a series of extensive improvements to Whitehaven, 84 miles from its mouth.

Lehigh University, an institution at South Bethlehem, Pa., founded by Asa Packer (q.v.), in 1865. He originally donated the land, 115 acres, upon which the buildings were erected, and $500,000. At his death he bequeathed $2,000,000, making in all a gift of about $3,000,000. The object the founder had in establishing such a school was to give the young men of the Lehigh Valley an opportunity to acquire a complete education, technical, literary, and scientific, suitable to fit them for those trades and professions represented in the development of the peculiar sources of the rich mining territory in which it is located. The institution was incorporated in 1866 and its first class was graduated in 1869. It has nine courses in the school of technology: civil engineering, mechanical engineering, marine engineering, metallurgical engineering, electro-metallurgy, mining engineering, electrical engineering, analytical chemistry, and chemical engineering, leading to appropriate engineering degrees. The school of general literature has a Latin scientific course, and a classical course, leading to the degree of B.A. Summer schools in the engineering courses are given each year. The master's degree in arts and sciences may be obtained by means of the graduate courses. Students in mining engineering have the advantage of frequently and regularly visiting the mines. The Bethlehem Steel Company and the Lehigh Valley Coal Company give the students many opportunities of study, especially when accompanied by an instructor. There are 14 college buildings; Packer Memorial Church, Packer Hall, laboratories, the Sayre astronomical observatory, a gymnasium, and other buildings which make a valuable group. The income is derived from the endowment fund and tuitions. In 1905 the productive fund was $1,250,000, and the income $100,000. Some assistance has been received from the State. Connected with the school, in 1905, were 56 professors and instructors, and 630 students. The library contains about 121,000 volumes. The graduates number (1905) about 1,400.

Le'highton, Pa., borough in Carbon County; on the Lehigh River, and on the Central of New Jersey and the Lehigh Valley R.R.'s; about 75 miles northeast of Harrisburg, the capital of the State, and 70 miles, in direct line, northwest of Philadelphia. It is a trade centre for a mining section of the county. Its chief manufactures are car-springs, flour, leather, stoves, furniture, brick, and mining tools. The borough owns the electric-light plant, but leases it to a private corporation who operates it. Pop. (1890) 2,959; (1900) 4,629.

Lehman, lā'man, **Rudolf Chambers,** English journalist, lawyer and authority upon rowing: b. near Sheffield, England, 3 Jan. 1856. He was educated at Cambridge and became a barrister of the Inner Temple in 1880. He has been a member of the staff of 'Punch' from 1890 and was editor of the London *Daily News* in 1901. He coached the Harvard crew in 1896 and 1897 and was given a dinner by the Harvard Club of New York on 10 April 1897. He has published among other works: 'In Cambridge Courts' (1891); 'Mr. Punch's Prize Novels' (1893); 'Isthmian Library: Rowing' (1897); 'Anni Fugaces,' verse (1901); 'Adventures of Picklock Holes' (1901).

Lehmann, lā'män, **Lilli,** German operatic singer: b. Würzburg 1848. Her mother, who was harp-player and prima donna under Spohr at Cassel, gave her the first musical instruction, and under her training Fräulein Lehmann developed a remarkable soprano voice. She made her début in Berlin (1870) and subsequently produced so good an impression that she was appointed imperial chamber singer in 1876. She became famous from the parts she took in the Nibelungen trilogy at Baireuth, and sang in Wagner's operas in London (1884), and as principal soprano in the same operas at the Metropolitan Opera House, New York, her principal roles being Brünhilde and Isolde.

Lehmann, Liza, English singer and composer: b. London. She is a daughter of Rudolf Lehmann (q.v.). She studied vocal music at London and Rome, and composition under Freudenberg and Hamish McKunn. On 23 Nov. 1885 she made her début in London; her success was assured, and she was received well throughout Great Britain and Germany. In 1894 she retired from public singing on her marriage with Mr. Herbert Bedford, a well-known composer. She devoted herself henceforth to composition and has produced works of freshness and originality, many of them tinged with a refined feeling which recalls the modern German romantic or emotional school. Her most successful works are the 'Persian Garden'; and 'The Daisy Chain' (1901).

Lehmann, Rudolf, Anglo-German painter and writer: b. near Hamburg 19 Aug. 1819. He was educated at the Johanneum, Hamburg, and proceeding to Paris studied painting under his brother Henry Lehmann; he was afterward the pupil of Cornelius and Kaulbach (q.v.) at

Munich. He went to Rome in 1839 and remained there 16 years. His largest picture is 'The Blessing of the Pontine Marshes by Sixtus V.,' which was bought by the French government after being exhibited in France 1846. In 1866 he settled in London, and became a successful portrait painter. He has published: 'An Artist's Reminiscences' (1894); 'Men and Women of the Century' (1898).

Leib, līb, **Michael,** American politician: b. Philadelphia 1759; d. 1822. He was sent to the State legislature, and to Congress in 1798, where his pronounced political opinions made him conspicuous. Re-elected in 1800 and again in 1802, he opposed the administration of Jefferson, whom he had at first supported, and was politically associated with William Duane (q.v.) who published the 'Aurora.' Returned to Congress in 1804, he there vigorously opposed Gallatin and entering the Senate in 1808 was there especially hostile to both Madison and Gallatin. He left the Senate in 1814 to become postmaster of Philadelphia.

Leibnitz, Gottfried Wilhelm, gŏt'frēd vĭl'hĕlm līb'nĭts, German metaphysician: b. Leipsic 21 June 1646; d. Hanover 14 Nov. 1716. From his earliest years he gave indications of remarkable genius and inherited from his father, who was a professor of moral philosophy, a love of historical study, and a taste for metaphysical speculation. In his sixth year his father died and he was removed from the Nicolai school at Leipsic and set free in his father's library. He soon ran through the ordinary German historical books and taught himself Latin by reading an illustrated edition of Livy. Before his 12th year he could translate Latin easily, and had begun Greek. In 1661 he entered the University of Leipsic. Here he became acquainted with the works of modern philosophers and mathematicians from Bacon to Descartes. In 1666 he was refused the degree of doctor of law on account of his youth, but immediately afterward received it from Altdorf, on which occasion his dissertation was so brilliant that a professorship was offered him, but he declined the position. The same year he visited Nuremberg, the centre of Rosicrucianism which he made the subject of profound study. At Nuremberg he met a former first minister to the elector of Mainz, and this led to his introduction to the elector himself, who subsequently employed the pen of the philosopher in furthering his own political plans. At that time Germany was threatened by France on the west and Turkey and Russia on the east, but even the sagacious arguments of Leibnitz failed to set a German prince on the throne of Poland (1669) or to induce Louis XIV. to send an expedition to Egypt, ostensibly for the purpose of crippling the commerce of Holland, but really in order that the armies of France might be diverted from attacking Germany. It was the discovery by Napoleon of Leibnitz's letter on this subject (1803) that led to the First Consul's futile campaign in the Nile Valley. But the negotiations on this subject had an important result in sending Leibnitz to Paris, where he made the acquaintance of Arnauld, the Port Royalist, Huygens, the Christian physicist, and Malebranche, the mystic psychologist. From Paris he went to London (1673) where he was elected fellow of the Royal Society. His studies in mathematics meanwhile resulted in the discovery of differential calculus. The discovery was claimed also by Newton, but it would appear, as in the case of Wallace and Darwin, that two great minds working independently on parallel lines had simultaneously arrived at the same conclusions. In 1676 Leibnitz was invited by the Duke John Frederick of Brunswick-Lüneburg to take charge of his library in the palace at Hanover and to employ himself in writing the history of the Brunswick-Lüneburg family. While thus engaged he found time to compose his 'Systema theologicum' (1686) in which he attempted to discover a common ground in the details of belief for the Roman and Reformed Churches. He also corresponded with Bossuet on this subject. He removed to Berlin in 1700, and founded the academy of which he became president for life. At that date began his intimacy with the electress Sophie Charlotte of Brandenburg, and her mother, Princess Sophie of Hanover. For five years Leibnitz enjoyed the friendship and intellectual society of the former, and her death in 1705 was a blow from which he never recovered. In 1712 at Vienna Leibnitz, who was strangely covetous of honors, was made imperial privy councillor and baron of the empire.

During the last 30 years of his life he was a laborious writer. Not only was his history of Brunswick completed, though fated to be unpublished until 1843, but he left scarcely any subject untouched by his tireless pen. Theology, jurisprudence, mathematics, metaphysics, history, politics, economic science and philology became in turn subjects of his comment. While his greatest claim as a thinker is based upon his philosophic system he has never stated his views in a single coherent treatise. In 1696 he made a clear utterance on some important points in replying to Locke's 'Essay on the Human Understanding.' In 1710 appeared what we may call an exposition of his philosophy from the deistic standpoint, 'Essaies de Théodicée sur la Bonté de Dieu, la Liberté de l'Homme, et l'Origine du Mal.' In 1704 he stated his theory of physics in his 'Monadologie,' a modification of Democritean atomism. He spent his last days in utter neglect, tortured by disease, forgotten by his friends and still grieving for the loss of the only woman he had ever loved. He was buried without any religious office and with only a single mourner to watch the grave close over one of the greatest men in the intellectual world of modern times.

Leibnitz in private life was almost secluded from the world. He was somewhat unfitted for social intercourse by his irritability and dislike of contradiction, though in the discussion of large questions or problems he was tolerant of other men's views and eager in acquiring information from any person. While almost ascetic in his control of appetite, he has been charged with avarice, and it would sometimes seem as if his thirst for temporal honors and public recognition was beneath the dignity of his truly gigantic mind. In philosophy Leibnitz may be classed with the Cartesians. If, as Coleridge says, 'Every man is either an Aristotelian or a Platonist,' Leibnitz was a Platonist. He comes in conflict with Locke on the subject of knowledge and denies that the mind is *tabula rasa,* but perhaps his views may best be summarized under the three familiar terms of his philosophic system. The first is what he calls the principle of Sufficient Reason. The meaning of this phrase seems to be, that there are two kinds of human cognition, that of intuition, which applies to truths that are self evident, such as the fact of identity, as, John is John, and that which relates to the content of John and asserts something more than his self evident identity. The content of John consists of facts to be proved, such as his character, his intellectual power, his natural disposition. Unless the statements concerning these things can be proved true they are not true. Leibnitz here makes a distinction between the analytical and synthetical sciences, and maintains that by the application of the Sufficient Reason, the higher sciences which are synthetical can be placed on as solid a basis of truth as those which are merely analytical, and based on the recognition of identity. It is in this way that he would build up speculative knowledge whether physical or metaphysical. Leibnitz revived the profoundest discovery of Greek philosophic subtility, when he propounded his atomism or «monadology» as he calls it. But the atoms of Democritus were merely material, those of Leibnitz are spiritual-self-determined beings, the highest of which is God. These atoms, he says, have neither parts, extension nor figure. They are but force centres, for substance can only be conceived of in its ultimate analysis as force. Space, matter and motion are merely phenomena. The greater amount of activity or power of perception the higher and more perfect is the monad. No two monads are alike, they vary by the clearness and intensity of the reflection which they receive of the universe. Yet they are all in harmony and so constituted as to form one universe with God as its efficient cause and the establisher of this harmony, which results in the existence of the best possible world. We have seen that Leibnitz is a spiritualist, and while he would make the manods of the body and the monads of the soul of different orders, he explains their communication with each other by the rule of what he calls Pre-existent Harmony. How do the emotions or volition of the soul operate upon the body? Here he finds a solution in «pre-established harmony,» as question-begging a term as the *κίνησις κατα παρέγκλισιν* of Epicurus, the occasionalism of Malebranche, or the dualism of Spinoza. «God,» he says, «created the soul in such a manner at first, that it should represent within itself all the simultaneous changes in the body; and that he has made the body also in such a manner as that it must of itself do what the soul wills; so that the laws which make the thoughts of the soul follow each other in regular succession, must produce images which shall be coincident with the impressions made by external objects upon our organs of sense; while the laws by which the motions of the body follow each other are likewise so coincident with the thoughts of the soul as to give to our volitions and actions the very same appearance as if the latter were really the natural and the necessary consequences of the former.» This is the famous theory of Pre-established Harmony.

Consult: Erdmann, ‹Leibnitii Opera Philosophicæ› (1839); Fischer, ‹Leibnitz und seine Schule›; Duncan, ‹English Translation of Leibnitz's Works› (1890); Dewey, ‹New Essays of Leibnitz› (1888).

Epiphanius Wilson, M. A.,
Editorial Staff of the ‹Encyclopedia Americana.›

Leidy, lī'dĭ, **Joseph**, American naturalist: b. Philadelphia 9 Sept. 1823; d. there 30 April 1891. He was graduated M.D. at the University of Pennsylvania in 1844, and in 1853 was elected to the chair of anatomy in that institution, a post which he long filled, as well as that of professor of natural history in Swarthmore College, Pa., to which he was appointed in 1871. He was the author of many valuable memoirs, chiefly published in the ‹Proceedings of the Academy of Natural Sciences,› the ‹Transactions of the American Philosophical Society,› and the ‹Smithsonian Contributions to Knowledge.› Among them may be cited: ‹Ancient Fauna of Nebraska› (1853); ‹Cretaceous Reptiles of the United States› (1865); ‹Fresh Water Rhizopods of North America› (1879).

Leif Ericson. See Ericson, Leif.

Leighton, lā'tŏn, **Frederick**, Lord, English painter: b. Scarborough 3 Dec. 1830; d. London 25 Jan. 1896. He received some lessons in art at Paris as early as 1839, and then followed further instruction at Rome. At 14 he entered the Royal Academy of Berlin and subsequent art studies were made by him at Frankfort, Brussels and Paris (1850). From Rome he sent to the Royal Academy exhibition of 1855 his picture of ‹Cimabue's Madonna Carried Through Florence›—a work which called forth general admiration, and was purchased by the Queen. He resided mostly in Paris for the next four years, studying and painting, and to this period belong, among other works, ‹The Triumph of Music› (based on the story of Orpheus and Eurydice); ‹The Fisherman and the Siren,› and ‹Romeo and Juliet.› Having finally settled in London, he was elected in 1864 an associate of the Royal Academy, and in 1869 a full academician. In 1878 he succeeded Sir Francis Grant as president of the Royal Academy, was knighted, and was also named an officer of the Legion of Honor. In 1886 he was created a baronet, and on 1 Jan. 1896 was raised to the peerage. From among his numerous works may be singled for special mention: ‹Paolo and Francesca› (1861); ‹Jezebel and Ahab› (1863); ‹Orpheus and Eurydice› (1864); ‹Hercules Wrestling with Death› (1871); ‹Elijah in the Wilderness› (1879); ‹Hero Watching for Leander› (1887); ‹Captive Andromache› (1888); ‹Greek Girls Playing at Ball› (1889); ‹The Bath of Psyche› (1890); ‹Lachrymæ,› now in the Metropolitan Museum, New York; as also the two large frescoes at the South Kensington Museum, representing respectively the ‹Arts of War› and the ‹Arts of Peace.› He achieved a high place as a sculptor by his ‹Athlete Strangling a Python› (1876), and his ‹Sluggard› (1886). The special merit of his work lies in the perfection of his draftsmanship and design; his coloring, though possessing the unfailing charm of harmonious arrangement, is only thoroughly satisfactory from the decorative point of view. A fine poetic quality conjoined with elegance in drawing and great refinement in execution, mark his whole work. His ‹Addresses to the Students of the

Royal Academy' appeared in 1896. Consult 'Lives' by Mrs. Lang (1885); Rhys (1895).

Leighton, Marie Connor, English novelist: b. Clifton, near Bristol. She was married to Robert Leighton (q.v.) with whom she has written several novels mentioned under his name, and is the author of 'The Harvest of Sin'; 'A Napoleon of the Press' (1900); 'Vengeance is Mine' (1902); 'Was She Worth It?' (1902); etc.

Leighton, Robert, English journalist and novelist: b. Ayr, Scotland, 5 June 1859. He was the son of Robert Leighton, a Scottish poet, was educated at Liverpool, was editor of the Bristol 'Observer' 1886–7, and has for many years been connected with the various periodicals published by Harmsworth. He married Marie Connor in 1889 and with her wrote 'Convict 99'; 'Michael Dred, Detective'; 'In the Shadow of Guilt' and other fictions. He has written by himself 'The Pilots of Pomona' (1892); 'The Thirsty Sword' (1893); 'The Wreck of the Golden Fleece' (1894); 'Olaf the Glorious' (1895); 'The Golden Galleon' (1897); etc.

Leipsic, līp'sĭk, or **Leipzig,** līp'tsĭg, Germany, the largest town of Saxony, and the fourth largest in the German empire, situated in a broad, fertile plain at the confluence of the rivers Elster, Pleisse, and Parthe. The city comprises the inner town, the inner and outer suburbs (Vorstädte). the more outlying suburbs (Vororte), incorporated with the city in 1889–92, all traversed and connected by electric street railroads. The former fortifications surrounding the inner city have been replaced by fine streets and promenades. The old city still retains much of its ancient appearance, but the modern suburbs are characterized by broad streets and imposing buildings. Among the squares of the city are the Marktplatz, with a Siegesdenkmal; the Augustusplatz, one of the largest in Germany, with a splendid fountain; the Königsplatz, the Johannisplatz, with a Reformation monument (Luther and Melanchthon); and the Rossplatz; and among the other monuments worthy of mention are those of Gellert and Fechner in the Rosenthal, an extensive park in the northwest, between the Elster and the Pleisse; of Hahnemann, Leibnitz, Grassi, Mendelssohn, and Bismarck; together with the more recent memorial of the Völkerschlacht. Besides the parks and open spaces just mentioned, Leipsic includes, among many others, the Johannapark, the Grassipark; the König Albert Park, the scene of the 1897 exhibition; the Johannisthal, with an observatory; the botanical garden; the zoological garden, recently much extended; the palm garden, opened in 1899. The most noteworthy churches of the city are the Thomaskirche (13th century), rebuilt 1885–9; the Nikolaikirche (11th century), recently restored; the University or Paulinerkirche (1240), restored 1896–9; the Matthäikirche, restored 1879; the Johanniskirche (14th century), rebuilt and re-consecrated in 1897, and containing the remains of Sebastian Bach and Gellert; the Peterskirche; the Lutherkirche; the Andreaskirche; two modern Roman Catholic churches; an Anglo-American church; a synagogue; and churches of other denominations. Of non-ecclesiastical buildings the most notable are those of the university, which was founded in 1409, and now has 220 professors and lecturers, and over 3,200 students. These buildings are mostly modern, especially the Albertinum, erected in 1890–6 in accordance with the plans of A. Rossbach for completing and renewing the whole group. The university library (the Albertina) contains 440,000 volumes and over 4,000 manuscripts. Other buildings and institutions are: the old Rathaus (16th century); the new Rathaus, in course of construction on the site of the Schloss Pleissenburg, a 13th century building, once the citadel of the town, and famous as the scene of Luther's disputation with Eck in 1519; the old exchange (1678), now the meeting-place of the town council; the new exchange in Renaissance style; the Königshaus (17th century), the residence till 1829 of the Saxon princes; the old Gewandhaus, where the celebrated Gewandhaus concerts were long held; the new concert-hall; the imperial bank building, in German Renaissance style; the municipal library (1899), containing 110,000 volumes and many manuscripts; the municipal museum, in Italian Renaissance style; the chief post-office; the new book exchange, the headquarters of the German book trade; the Buchgewerbehaus (1897), with a Gutenberg hall; the panorama building; the Grassi Museum (1896), now including the collections of the former museums of industrial art and ethnology; the police office; the building of the Land and Amtsgericht, enlarged in 1895–6; the building of the Imperial Court, completed in 1895; the new conservatory of music; the old and the new theatre; the Krystallpalast, including concert halls, etc.; the market hall; the large Johannis hospital; a deaf and dumb and a blind institution; the hospital of St. Jakob; the Triersches Institut, for women; three gymnasia, namely, the Thomasschule (1221), the Nikolaischule (1511), and the royal Gymnasium, a Real Gymnasium; several Realschulen and many other schools; a Handelshochschule, or High Commercial School (1898), the first in Germany; a school of industrial art; a Royal Academy of Arts; and the new infantry barracks at Möckern. Leipsic has railway communication with all the chief towns of Germany, and its situation makes it of great importance as a trading centre. It has three large annual fairs, which have been held ever since the 12th century. It is the headquarters of the book trade in Germany, and takes a foremost place among European towns in the many industries associated with the publication and printing of books. Its other industries include iron-founding, cotton-spinning, wool-combing, the weaving of jute and linen, brewing, sugar-refining, distilling, and the manufacture of machinery, electrical plant, agricultural implements, ethereal oils, dyes, essences, soaps, perfumes, wax-cloth, chocolate, tobacco, paper, leather, tapestry, cement, musical and other instruments, etc. Leipsic is also a world market for furs and all similar goods. The name Leipsic, from the Slavonic *lipa*, a lime-tree, is found applied to a Slavonic fishing village near the present site of Leipsic about 1017. The history of the town during many centuries is one of gradually extending importance. It suffered much during the Thirty Years' war at the hands of both combatants. Its position of pre-eminence in the book trade dates from the latter half of the 17th century. During the earlier years of the 18th century the town became the centre of a literary movement under Gottsched. Leipsic and its neighborhood suffered greatly during the Napoleonic wars, and on 16–19 Oct. 1813 a series of severe battles fought around the town resulted in a crushing defeat of Napoleon, and the retreat of the French from Germany. During the war of 1866 Leipsic was occupied by Prussian troops for 18 months. In 1879 the Supreme Court of Justice for the empire was established in the city. Pop. (1900) 455,089.

Leisler, lĭs'lėr, **Jacob**, American colonial political leader: b. Frankfort-on-the-Main, Germany; d. New York 16 May 1691. He came to America as a private soldier in the service of the Dutch West India Company, and was for a time engaged in trade at Albany, and later settling in New York was appointed in 1783 one of the «commissioners» (judges) of the court of the admiralty. In 1689 he was the leader of the insurrection against Governor Nicholson, supported mostly by the militia and the lower classes; the fort and the public funds were seized on the 31st of May, and Leisler a few days later declared for William and Mary, asserting his acts to be necessary for the «preservation of the Protestant religion.» A committee of safety was formed, who on 8 June commissioned Leisler as «captain of the fort.» In this capacity he at once began to repair the fort, and strengthened it with a «battery» of six guns beyond its walls, which was the origin of the public park still known as the Battery. Nicholson and the council of the province, with the authorities of the city, attempted by pacific means to prevent the uprising, but without effect. Becoming finally alarmed for their own safety, the lieutenant-governor sailed for England, and the mayor with the other officials retired to Albany. On 16 August the committee of safety appointed Leisler «commander-in-chief of the province,» with the full power of a governor in all matters civil and military. He next attempted to reduce Albany and the northern parts of the colony, which from the first had refused to recognize his authority, but was for some time unsuccessful; Albany finally submitted to him after the Indian attack on Schenectady (1690). In December arrived a despatch from William and Mary directed «to Francis Nicholson, Esq., or in his absence to such as for the time being takes care for preserving the peace and administering the laws in his majesty's province of New York.» This Leisler construed as an appointment of himself as the king's lieutenant-governor. He therefore dissolved the committee of safety, swore in a council, and assumed the style of a royal lieutenant-governor and commander-in-chief. After the massacre at Schenectady he engaged with great vigor in the expeditions against the French, and equipped and despatched against Quebec the first fleet of men-of-war ever sent from the port of New York. A few months later Major Ingoldsby arrived with the news of Sloughter's appointment as governor, and demanded possession of the fort, which Leisler refused. On Sloughter's own demand immediately upon his arrival in March 1691, he likewise refused to surrender it, until convinced of Sloughter's identity, and the latter had sworn in his council. Leisler was immediately imprisoned, charged with treason and murder, and shortly after tried and condemned to death. His son-in-law and secretary Milborne was also condemned on the same charges. These trials were manifestly unjust; the judges were the personal and political enemies of the prisoners, and Sloughter for some time hesitated to sign the death warrants. Leisler's son secured from the English Parliament the reversal of the bill of attainder in 1695; and the confiscated estates were also returned to the heirs. Consult: Brodhead, ‹History of New York›; ‹Documentary History of New York›, and E. S. Brooks, ‹In Leisler's Times› (a historical story).

Leith-Adams, Mrs. See Laffan, Bertha Jane.

Leith, lēth, Scotland, a seaport and parliamentary burgh in the county of Midlothian, and a northeastern suburb of Edinburgh, on the south shore of the Firth of Forth, on both sides of the Water of Leith. It is connected with Edinburgh by Leith Walk and other lines of streets, and by branch lines of the railways centering in Edinburgh. Among the principal public buildings are the custom-house, exchange buildings, court-house, Trinity House, corn-exchange, the new and well equipped Leith Academy, including the Leith Technical College, and there are fine parks and public golf links. The chief manufactures are ropes, sail-cloth, oil-cake, paints, colors, artificial manures, and there are shipbuilding-yards, iron-foundries, engine-works, flour-mills, oil-mills and refineries, steam saw-mills, large maltings, an ice factory, etc. The foreign trade is chiefly with the Baltic and the principal French and German ports, and there is a trade in grain, flour, etc., with the United States and Canada. There are extensive wet-docks, and several public graving-docks, capable of receiving the largest vessels. Leith is a very ancient town, its earliest charter dating from 1128. Pop. (1901) 77,439.

Leitha, lī'tä, Austria-Hungary, a river rising in Lower Austria, and flowing northeast for the greater part of its course of 90 miles along the frontier of Austria and Hungary, until it joins the Danube at Altenburg. The Leitha Mountains rise between it and Lake Neusiedl, and it has a factitious importance in its application to Hungary as Trans-leithan and Austria as Cis-leithan.

Leitmotiv, līt'mō-tēf, in music, the leading theme, the characteristic phrase, which occurs over and over again in the same composition, in reference to the same person, phrase of feeling or scenic complication of intense passion or action. The phrase strikes the note of these several crises or conjunctures and recurs whenever they are repeated. While many operatic composers, such as Mozart and Weber, have employed the expedient of the leading theme, Wagner does so more than any other modern musician. In his Leitfäden, or analyses of his operas, in which he lays bare some of the secrets of his artistic workmanship, he shows that he has consciously individualized every one of his characters, every change in the scenery or action of the drama, or in the emotions and moods of the *dramatis personæ*, by the introduction of a specific musical theme, which he employs throughout the opera to suggest the same thing. This theme is worked upon and varied with the masterly skill which Wagner possesses in fugue and part writing. Thus in his ‹Parsifal,› Klingsor, Kundry, Parsifal, Amfortas, and the Flower maidens are all ushered in with a special leading theme for each. There is a special theme for the Eucharist, for the spear (*Speermotiv*), for the Holy Grail (*Gralmotiv*). The children's voices raise a strain ‹Faith is still alive› to the notes of the *Glaubensthema,* or faith-motive. There is a *Leidensmotiv,* to express the grief of Amfortas; there is the Doormotiv, expressing the promise of help; the Zaubermotiv, suggesting the devilish power of witchcraft, while the mother's sorrow is suggested by the Motiv des Herzleids, the heart-grief's theme. The Bell-theme, with its pealing sound, the Ride-theme, suggesting the clatter of horsehoofs, the Good Friday theme, with its characteristic chords, each in its way, are powerfully suggestive, and when once recognized, their recurrence has a powerful effect.

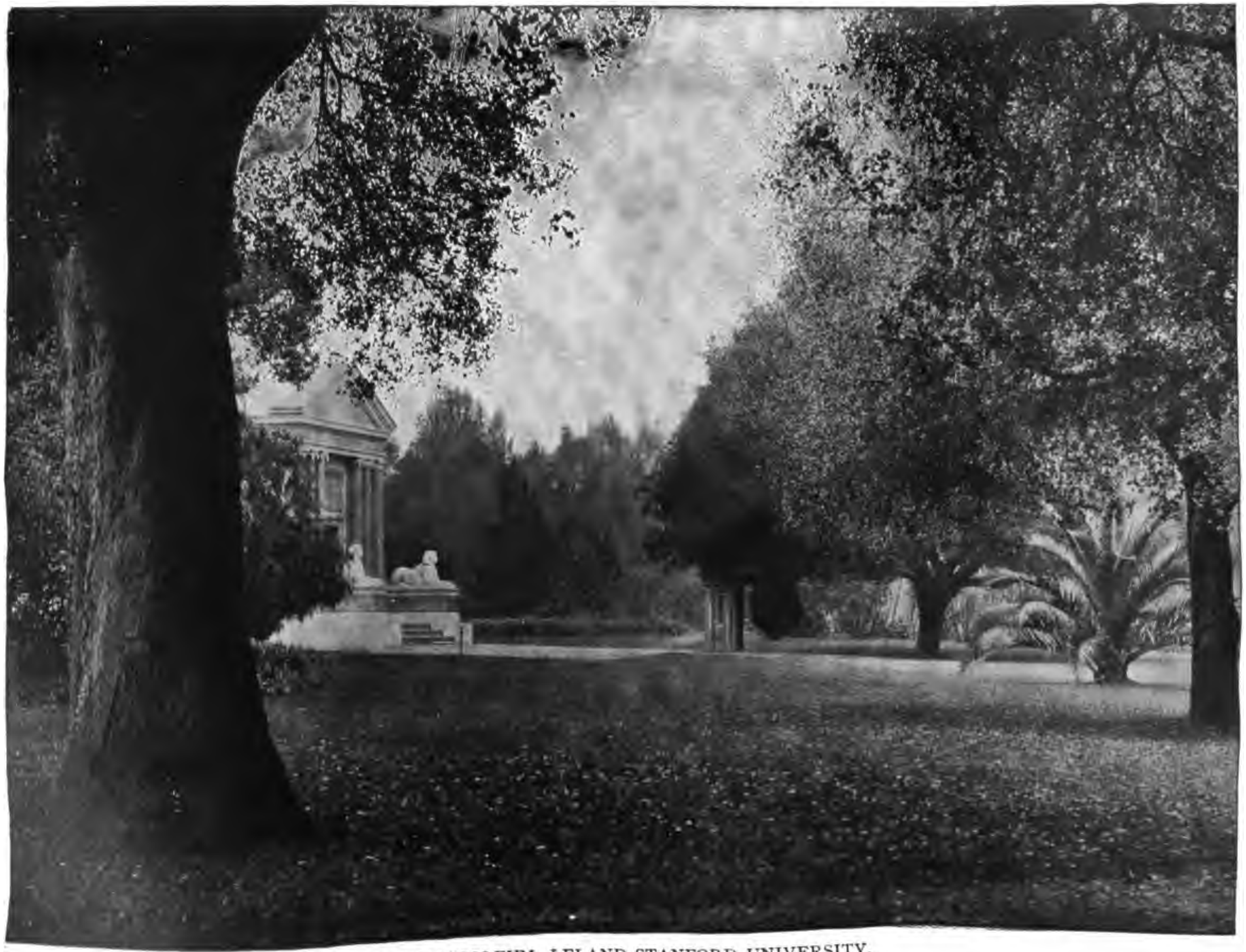
Leixner-Grünberg, līks'nĕr grün'bĕrg, **Otto von,** German poet and critic: b. Saar in Moravia 24 April 1847. Among his poetical works are: a volume of ‹Poems› (1868); the drama ‹Resurrection of Germany› (1870); ‹Twilight› (1886); ‹Proverbs and Satiric Rhymes.› He has also written short stories: ‹The Two Marys›; ‹Memento Vivere›; ‹Princess Sunshine› (1882). Still other works are: ‹Marginal Notes by a Hermit›; ‹Gossamer› (1886); ‹Gossipy Letters to a Young Matron› (1890); ‹Lay Sermons› (1894). His ‹History of German Literature› (1879–82) is a notable work.

Le'land, Charles Godfrey, American author: b. Philadelphia 15 Aug. 1824; d. Florence, Italy, 20 March 1903. He showed poetic talent in youthful contributions to newspapers, and a growing genius, marked by unusual versatility, during his college days at Princeton, where he was graduated in 1846. He studied afterward at Heidelberg, Munich, and Paris, giving special attention to modern languages, philosophy, and æsthetics. In 1848 he took part in the revolutionary uprising in Paris; the same year returned to Philadelphia and studied law; was admitted to the bar in 1851, but gave up the legal profession and devoted himself to literary pursuits, becoming prominent in various fields of journalism and authorship. For a time he was editor of the New York ‹Illustrated News›; in 1861 established the ‹Continental Magazine› in Boston, and two years later returned to Philadelphia, where for several years he edited the *Press*. During the Civil War he published ‹The Book of Copperheads,› a political satire. From 1869 to 1880 he resided chiefly in London. In England and on the Continent he studied gypsies and gypsy lore, in which he became one of the leading authorities of his time. His career as poet, ethnologist, and traveler, with its mingling of literary avocations, was invested with an element of romance, and his more serious work was lightened by the interchange of humor. At the same time his achievements show the practical talents of a man of business. When in 1880 he once more returned to Philadelphia he was instrumental in establishing industrial teaching in the public schools, in furtherance of which he wrote a number of manuals and gave his supervision to the work. From 1886 he lived in Europe, mainly in Florence. He wrote and translated a large number of works, remarkable for variety as well as for literary value, the best known and most popular of which are ‹Hans Breitmann's Ballads› (1867–70, 1895), written in «Pennsylvania Dutch,» his translations from Heine, including ‹Pictures of Travel› (1856), and ‹Heine's Book of Songs› (1862), ‹English Gypsies and Their Language› (1873), ‹English Gypsy Songs› (in collaboration, 1875), ‹The Gypsies› (1882), and ‹Gypsy Sorcery and Fortune-Telling› (1892). Among his other writings are: ‹The Poetry and Mystery of Dreams› (1855); ‹Meister Karl's Sketch-Book› (1855); ‹Sunshine in Thought› (1862); ‹Legends of Birds› (1864); ‹The Music-Lesson of Confucius› (1870); ‹The Egyptian Sketch-Book› (1873); ‹Fu-Sang: or the Discovery of America by Chinese Buddhist Priests in the Fifth Century› (1875); ‹Johnnykin and the Goblins› (1876); ‹Pidgin-English Singsong› (1876); ‹Abraham Lincoln› (1879); ‹The Minor Arts› (1880); ‹Algonquin Legends of New England› (1884); ‹Etruscan-Roman Remains in Popular Tradition› (1892); ‹Autobiographical Memoirs› (1893); ‹Songs of the Sea and Lays of the Land› (1895); ‹Mending and Repairing› (1896); ‹One Hundred Profitable Acts› (1897); ‹The Unpublished Legends of Virgil› (1899); and (his last work) ‹Kuloskap the Master, and Other Algonkin Poems› (1903), a volume of Indian folklore in verse, written in collaboration with John Dinely Prince.

Leland, lĕl'and, or **Leyland, John,** English antiquary: b. London about 1506; d. there 18 April 1552. He was educated at Cambridge, Oxford, and Paris. Returning home he took holy orders, and Henry VIII. made him his chaplain and librarian. In 1530 he became rector of Pepeling, near Calais; in 1542 he received the rectory of Haseley, Oxfordshire, and he was a prebend of Salisbury Cathedral. In 1533 he received the title of royal antiquary, and was empowered, by a commission under the great seal, to search for objects of antiquity in the archives and libraries of all cathedrals, abbeys, priories, etc., in consequence of which he spent six years in traveling and collecting materials for the illustration of the history and archæology of England and Wales, but died without having completed his undertaking. The great bulk of his collections was placed in the Bodleian Library. The first part to be published was the ‹Commentarii de Scriptoribus Britannicis,› issued in 1709 by Anthony Hall. In 1710 Hearne published the ‹Itinerary› in 9 vols., and five years later the ‹Collectanea› was issued by him in 6 vols. Leland wrote Latin poetry with considerable elegance, and a collection of his miscellaneous Latin verse and epigrams was published in 1589.

Leland Stanford Junior University, a coeducational institution at Palo Alto, California, about 35 miles southeast of San Francisco, in the Santa Clara Valley. The University Campus comprises 9,000 acres of land, partly in the level of the valley and partly rising into the foothills of the Santa Moreno Mountains which separate it from the Pacific Ocean, 33 miles beyond. The Bay of San Francisco lies in front at a distance of three miles and across it are the mountains of the Diabolo range.

The University was founded by Leland Stanford (q.v.) and his wife, Jane Lathrop Stanford (q.v.), as a memorial to their only son who died



THE MAUSOLEUM, LELAND STANFORD UNIVERSITY,
Here are buried Leland Stanford and Leland Stanford, Jr.

in his 16th year. The founders desired that the University should give a training primarily fitted to the needs of young men. Both sexes are admitted to equal advantages in the institution, but the number of young women who may attend at any given time is limited to 500. The object of the University as stated by its founders is «to qualify students for personal success and direct usefulness in life,» and to «promote the public welfare by exercising an influence in behalf of humanity and civilization, teaching the blessings of liberty regulated by law, and inculcating love and reverence for the great principles of government as derived from the inalienable rights of man to life, liberty and the pursuit of happiness.»

The endowment grant establishing the University was made in November 1885, under an act of legislature passed for this purpose; the cornerstone of the institution was laid in May 1887; and the University was formally opened to students on 1 Oct. 1891. The attendance for the first year numbered 559 and included all college classes with a number of graduate students, the University graduating its first class of 38 in May 1892. The original faculty numbered 35 professors and instructors and the first, and to the present time (1903) the only, president has been David Starr Jordan (q.v.).

The architecture of the University buildings is patterned after the old Spanish missions of California and Mexico. The buildings are of buff sandstone with red tile roofs. They form two quadrangles, one within another, with detached buildings grouped about them. The inner quadrangle consists of 12 one-story buildings, connected by an open arcade, facing a paved court of three and one quarter acres in extent. Connected with this quadrangle at various points by corridors, and completely surrounding it, is the outer quadrangle of 12 buildings, for the most part two stories in height above the basement. This outer quadrangle is again surrounded by a continuous open arcade. In the inner quadrangle are the departments of law, of the different languages, and mathematics, and the administrative offices. In the outer quadrangle are the scientific, engineering and geological departments, those of history, economics and English, and the library and assembly hall. In the rear of the quadrangles are the central lighting, heating and power plant and the laboratories and shops of the engineering departments. The dormitories, one for young men and another for young women, with their gymnasia and athletic grounds about them, are located to the east and west. In front on either side of the main drive are the buildings for the department of chemistry and the art museum and the new gymnasium, the latter in course of erection. The final building to complete the general scheme of buildings, which is to be the permanent home of the University library, will soon be begun.

Most striking among the architectural features of the University buildings are the Memorial Arch and the Memorial Church. The former is 100 feet in height, 90 feet in width and 34 feet deep, with an archway of 44 feet spanning the main entrance. A sculptured frieze 12 feet in height, designed by St. Gaudens, and representing the progress of civilization, surrounds the arch. The Memorial Church opens from the inner court and is opposite the main entrance. It is of Moorish-Romanesque architecture, its spire rising to a height of 188 feet. The church, erected by Mrs. Stanford in memory of her husband, is adorned within and without with costly mosaics, representing as do the beautiful stained windows, Biblical scenes and characters. It has a splendid organ of 46 stops and 3,000 pipes and a chime of sweet-toned bells. The church is non-sectarian in character and method. Religious services are held each Sunday morning and afternoon. There is a week-day vesper service and the organ is played each day at the close of recitations.

The students live in the dormitories, in club houses on the grounds, or in private boarding-houses in the village, which is situated a mile distant from the University buildings. The professors live in homes provided on the grounds or in the village. Twelve Greek-letter societies for young men and five for young women occupy chapter homes on the campus.

In the government of the students, «the largest liberty consistent with good work and good order is allowed. They are expected to show both within and without the University such respect for order, morality, personal honor, and the rights of others as is demanded of good citizens. Students failing in these respects or unable or unwilling to do serious work toward some definite aim are not welcomed and are quickly dismissed.»

The University Council consists of the president, professors, and associate professors of the University faculty. To it is entrusted the determination of requirements for admission, graduation, and other matters relating to the educational policies of the institution. It acts as an advisory body on questions submitted to it by the president or trustees. The routine work of the faculty is divided among various standing committees with power to act and responsible primarily to the president. Departmental affairs are in the hands of subordinate councils consisting of the instructing body in the department, a member of which is designated by the president as presiding officer.

The general control of the University's affairs was by special provision in its charter reserved to the founders or either of them during their lifetime, they to act in the capacity of a board of trustees, the trustees themselves having only a nominal connection. This provision remained in force until July 1903, when under a special act of legislature passed for the purpose, Mrs. Stanford finally turned over to the board of trustees full authority and control over the University. The board of trustees numbers 15, members being elected for a term of 10 years. In educational matters the president of the University has the initiative, his acts being subject to the confirmation of the trustees. The board through a treasurer and business manager, one of their own number, administers directly the financial affairs of the institution.

The endowment of the University comprises 90,000 acres of land, including the Palo Alto estate; the Stanford home in the city of San Francisco, and interest-bearing securities, the whole amounting to about $30,000,000, two-thirds of which is productive of income. For the present the income of the University is devoted largely to the completion of its buildings.

In its entrance requirements the University recognizes 29 entrance subjects of different values according to the time devoted to them in the secondary schools. The unit of value is a full year of high school work in the particular subject, and any 15 units, with certain limitations, chosen from this list constitutes preparation for full entrance standing. The University has no list of accredited schools, but considers on its merits the work of all reputable schools. The student chooses a major subject, the professor in which becomes his adviser and to which he is required to devote one fourth of his time. His remaining time is filled up by courses chosen by the student under the advice and direction of his major professor. Fifteen hours of recitations per week constitutes the regular course throughout a period of four years. Students are graduated when they have completed 120 hours of work and the requirements of their major subject. Degrees are conferred in May, September, and January.

The University grants the undergraduate degree of A. B. in all courses; the degrees of A. M. and Ph. D. for one and three years' work respectively beyond the undergraduate requirements; the LL. B. degree in law, and that of Engineer for graduate work. The University grants no honorary degrees.

The work of the University is grouped under the following departmental heads:

Greek, Latin, Germanic Languages, Romanic Languages, English Language and Literature, Philosophy, Psychology, Education, History, Economics and Social Science, Law, Drawing, Mathematics, Physics, Chemistry, Botany, Physiology and Hygiene, Zoology, Geology and Mining, Civil Engineering, Mechanical Engineering, Electrical Engineering.

The University Library contains 75,000 volumes. The attendance for the year 1902–3 was 1,483, of which 998 were men, 485 women. The faculty numbers 130. Tuition is free to California students. Those from other States pay a registration fee of $10 per semester.

George A. Clark,
Secretary of the University.

Leland University, a Baptist institution for the education of the colored people; founded in 1869, in New Orleans, La., by Holbrook Chamberlain of Brooklyn, N. Y. It has large grounds, commodious and well equipped buildings, and a fair endowment. It is a school and a system of schools, with a faculty of over 60 members and co-ordinated courses of study. It is made up of a number of academies, each built and maintained by one of the 15 Baptist Associations in the State. The courses consist of the usual work of the elementary and secondary schools, including a preparatory department where pupils are fitted for college. In addition are a college, a theological department, training classes for pastors and teachers, and departments of manual training, domestic science, and agriculture. Dr. R. W. Perkins is president (1903), and the board of trustees is made up of prominent citizens of New Orleans, La., and Brooklyn, N. Y. The number of students in 1903 was over 2,000.

E. R. W. Perkins,
Leland University.

Le Loutre, Louis Joseph, loo-ē zhō-zĕf lė lootr, French missionary: b. about 1692; d. about 1775. He was vicar-general of Acadia, and from about 1740, when he was sent to Nova Scotia, he labored for years among the Micmac Indians of that region with great success, obtaining practical control of all their affairs, spiritual and otherwise. He led them against the English, and when the country fell into the hands of Great Britain succeeded in compelling the Acadians to show their allegiance to King Louis, although for years they had been subjects of King George. The consequence was terrible suffering for the simple people, whose miseries became historic through their deportation in 1775. Le Loutre fled to Quebec, sailed for France, was taken by the English and kept prisoner in the Isle of Jersey for eight years. Being released, he returned to France, where he died.

Lely, lē'lĭ, Sir **Peter**, Dutch painter: b. Soest, Westphalia, 1618; d. London 30 Nov. 1680. His real name was Pieter van der Faes, but he assumed as his artistic title a nickname, Lely, or rather Le lys, which had been borne by his father. He was the pupil of Peter Grebber in his early manhood, but went to England in his 23d year and began his career as a portrait painter. His pictures were much admired and Charles I. appointed him court painter. He painted the portrait of that sovereign and also of Cromwell, but he reached his greatest eminence after the Restoration. He was an imitator of Van Dyck, whom he almost equaled in the excellence of some of his earlier work. But as he fell in with the artificiality of Charles II.'s licentious court his manner lost much of its dignity and originality, and with a fatal facility he assumed that mannerism which detracts so much from the artistic worth of his portraits. His coloring as well as his drawing became weak and conventional. He was, however, a great favorite with the king and his famous ‘Beauties of Hampton Court’ was painted at the request of his royal master, these «beauties» being the loveliest women of the court, including the Duchess of Cleveland. Lely founded the school of English portrait, and up to the time of Reynolds and Lawrence was its ablest representative. His method of handling, as well as his conception of the portrait, were long imitated, and even to-day have their influence.

Lemaître, Jules, zhül lė-mätr, French critic: b. Vennecy, Loiret, 27 April 1853. He was a teacher in various schools, and a professor at Grenoble in 1883–4. He then resigned his post and entered on a successful literary career at Paris. Though he wrote two books of verse and three of short stories, he won his position in French letters by his criticism, his essays having associated him with Brunetière as a representative figure. ‘Impressions du Théâtre’ (1888 et seq.), and ‘Contemporains’ (1886 et seq.) collect the best of his articles. His dramas, such as ‘Deputé Leveau’ (1891), ‘Les Rois’ (1893), and ‘Le Pardon’ (1895), have also been much approved.

Léman, lā-män̈, **Lake**, a name sometimes given to the Lake of Geneva. See Geneva, Lake of.

Lemars, lẹ-märz', Iowa, city, county-seat of Plymouth County; on the Chicago, St. P., M. & O., and the Illinois C. R.R.'s; about 155 miles northwest of Des Moines, the capital of the State, and 24 miles north by east of Sioux

City. It is situated in an agricultural region in which cattle, wheat and corn are raised extensively. The chief manufactures are foundry and machine-shop products, flour, brick, blank books, and dairy products. It has a public library. Lemars is the seat of the Western Union College, under the auspices of the United Evangelicals. Pop. (1900) 4,146.

Lemberg, lĕm'bĕrg, Austria, the capital of the crownland of Galicia, on the Peltew, 365 miles by rail northeast of Vienna. Founded in the 13th century and formerly surrounded by walls, the city notwithstanding has a modern appearance, the walls having been replaced by boulevards and promenades. It is the seat of the crownland government, and of the important courts and public offices connected with it, also of three metropolitan sees, Greek, Armenian, and Roman Catholic, with their cathedrals and establishments. The university founded in 1784 and reorganized in 1817 is attended by about 2,000 students, and has a library of over 86,000 volumes. The National Institute founded in 1817 by Ossolinsk has a library of over 80,000 volumes and 3,000 MSS. chiefly of Polish literature. The manufactures are extensive and varied, and there is a large trade, mostly in the hands of Jews. The heterogeneous population consisting of Jews (over 31,000), Poles, Ruthenians, and Germans, was (1900) 159,618.

Lémery, lām-rē, **Nicolas,** French chemist: b. Rouen 17 Nov. 1645; d. Paris 19 June 1715. At an early age he displayed a taste for chemistry, went to Paris in 1666, and attached himself to Glaser. He soon left Glaser and took up his abode at Montpelier, where he had the free use of a laboratory, and began to give lectures which excited great interest and were attended by many of the influential inhabitants of the place. In 1672 he returned to Paris and gave courses of lectures on various parts of chemistry, the success of which seems to have been very great. His ‘Cours de Chimie’ appeared in 1675. This book went through numerous editions — 31, it has been calculated — and was translated into the chief European languages. The book is plainly modeled upon the prior treatises of Lefebvre and Glaser, the opening chapters being identical in manner and treatment, but shows proof of the author having profited by the work of his predecessors. In 1681 the religious troubles began to harass him; he was required to demit his office by a given time, and had ultimately, in 1683, to take shelter in England, where he was well received by Charles II, to whom he dedicated an edition of his book. He returned later to France, graduated as doctor of medicine at Caën, went to Paris, where he soon had a very large practice; but in 1685 the revocation of the Edict of Nantes forbade him, as a Protestant, the exercise of this profession. Against this he struggled for a little, but in 1686 joined the Roman Catholic Church. In 1699 he became an associate of the Academy of Sciences. Besides the ‘Course of Chemistry,’ Lémery wrote and published other works and papers, among which may be mentioned: ‘Pharmacopée universelle (1697); ‘Traité universelle des Drogues simples’ (1698); ‘Traité l'Antimoine’ (1707). It deserves to be remembered that he was one of the first to attempt the elucidation of natural terrestrial phenomena by referring them to chemical action, and to exhibit these on an experimental scale, as when he made what is still known as Lémery's volcano, by placing a mixture of sulphur and iron in a hollow, heaping up the earth over the mixture, moistening, and leaving it to itself. By-and-by combination between the iron and sulphur begins, heat is evolved, the earth heaves and swells, steam escapes, and the resemblance of the miniature eruption to the larger original is very striking. He left two sons, both of whom were afterward distinguished as chemists.

Lem'ly, Henry Rowan, American soldier: b. North Carolina 12 Jan. 1851. He was graduated from West Point in 1872, and was appointed 2d lieutenant of the 3d cavalry. In March 1898 he was promoted captain, and during the Spanish-American War commanded Battery C of the 7th United States Artillery in the Porto Rico campaign. He was retired at his own request 20 April 1899. He has published ‘What Was El Dorado?’; ‘Among the Arapahoes’; ‘West Point Romance’; ‘Padre Anselmo’; ‘A Queen's Thoughts’; etc.

Lemly, Samuel Conrad, American naval officer: b. Salem, N. C., 14 March 1853. He was graduated at the United States Naval Academy in 1873; was promoted lieutenant in January 1886; and in 1892 was appointed judge advocate-general of the navy. He was reappointed in 1896 and 1900, and in 1901 was the legal representative of the navy in the Schley Court of Inquiry.

Lem'ming, a short-tailed rat-like animal, related to the European voles and American meadow-mice, which inhabits the high mountains of Scandinavia. Its technical name is *Myodes lemmus,* and closely related species are found in northern Siberia and in Arctic America. In general appearance these animals are more like miniature short-eared, yellowish rabbits or pikas than like mice; they subsist wholly upon vegetable food, dwell in nests made of bark, grass, etc., in some sheltered nook, and do not hibernate but force their way about underneath the snow in search of moss, lichens, sprouting woody plants and other edible things. They are very prolific, rearing two broods of four to six young annually, and hence every few years they become so numerous that the mountains can no longer support the hordes. At such times, occurring at irregular intervals of several years according to circumstances, an exodus takes place, and great numbers of lemmings descend from the mountains and spread over the lowlands. There the easier climate, more abundant food and absence of enemies, permit a still further multiplication, so that by the following season the little animals have increased into a plague. They wander more and more widely, overrun and damage, or sometimes wholly devour crops, gardens and meadows, and make themselves a destructive nuisance. Such an invasion is felt more severely in the narrow and fertile valleys of Norway than in the broader and more forested spaces of Sweden. At such a time concerted measures are devised to kill them off, carnivorous mammals and birds flock to the feast, and epidemic diseases often break out among them. Spreading with a restless energy for travel, the lemmings overcome or attempt to overcome all obstacles, and heedlessly plunge into lakes too large or rivers too swift to be crossed. When the remnants of the host reach the sea many of them boldly swim out in their ignorance of its magnitude and are drowned. Such overrunning of the country by lemmings is not known in Arctic Asia or America, where different conditions exist.

Lemming-mice, certain small mice-like animals closely related to the lemmings and having similar traits, inhabit the region about Hudson Bay and the southern part of Greenland, of which the most prominent is *Cuniculus torquatus,* chiefly remarkable for its turning white in winter. Other species belong to the genera *Synaptomys, Lemmus,* etc.

Lem'mon, John Gill, American botanist: b. Lima, Mich., 2 Jan. 1832. He studied at the University of Michigan, but left to enter the Federal army in June 1862, and was a prisoner at Andersonville, Ga., from August 1864 till the end of the Civil War. He has lived in California from 1866, where he was for four years botanist of the State Board of Forestry. He has published ‹Recollections of Rebel Prisons› (1874); ‹Ferns of the Pacific Slope› (1884); ‹Handbook of North American Cone Bearers› (1895); ‹Botanizing in Apache Land› (1901); ‹How to Tell the Trees› (1902); etc.

Lem'nian Earth, a reddish earth found in the island of Lemnos, celebrated as a remedy for snake-bites and various diseases, and collected by the ancients in accordance with special religious observances on only one day in the year. Analysis shows it to be composed of silica, 67 per cent; alumina, 14 per cent; water, 8 per cent; iron oxide, 5 or 6 per cent; soda, about 3 per cent, and traces of lime and magnesia. Its classical name ‹terra sigillata› (sealed earth) is due to the fact that it was compressed and marked with the head of the Lemnian Diana. The earth is a fair substitute for soap, but has no medicinal properties.

Lem'nos, the classical name for STALIMENE, the northernmost island of the Grecian archipelago, between the Hellespont and Mount Athos. It anciently contained a volcano, Mosychlus, which was regarded as the workshop of Hephaistos (Vulcan), and was worshipped by the Greeks as sacred. The island belongs to Turkey and consists of two peninsulas almost separated by the harbors of Paradiso and San Antonio. It has an area of 160 square miles, and abounds in vineyards, wheatfields, olive and fruit groves. The chief town is Limno or Kastro, with 3,000 inhabitants, a fortified place on the west coast. Pop., chiefly Greeks (1903) 27,000.

Le Moine, lĕ-moin', SIR **James MacPherson,** Canadian historian: b. Quebec 24 Jan. 1825. He was educated in his native city and in 1850 was called to the bar. In 1869 he was appointed inspector of the inland revenue district of Quebec. He was knighted in 1897. Among his works are: ‹L'Ornithologie du Canada› (1860); ‹Etude sur les Navigateurs Arctiques Franklin, McClure, Kane, McClintock› (1862); ‹The Tourist's Note-Book› (1870); ‹Quebec: Past and Present› (1876); ‹The Scot in New France› (1880); ‹Picturesque Quebec› (1882); ‹The Land We Live In› (1891).

Lemon, Mark, English humorist and playwright: b. London 30 Nov. 1809; d. Crawley, Sussex, 23 May 1870. He made his first essays in the lighter drama, and the modern London stage was supplied by his facile pen with more than 60 pieces, farces, melodramas, and comedies, among which were: ‹The School for Tigers,› ‹The Serious Family,› and ‹The Ladies' Club.› On the establishment of ‹Punch› in 1841 he became joint editor with Henry Mayhew, and two years later, sole editor, controlling that periodical for 29 years. He was also literary editor of, and frequent contributor to, the ‹Illustrated London News.› Among his later productions are several novels: ‹Loved at Last,› ‹Golden Fetters,› etc. He also edited ‹Mark Lemon's Jest Book.›

Lemon, a small tree or spreading shrub (*Citrus medica* var. *limon*) of the natural order *Rutaceæ.* It is a native of India, but has been introduced into tropical and subtropical countries throughout the world, especially those of the Mediterranean region, whence it was imported into Florida and California. In Florida the cold wave of 1894–5 destroyed most of the orchards, leaving only those in the southernmost counties, the soil of which is poorly adapted to the trees and must be carefully mulched, fertilized and managed to yield profitable returns. In California the lemon was introduced about 1850, but did not become commercially important until the closing quarter of the 19th century, during the last ten years of which the annual shipments to eastern markets averaged about 1,200 carloads, although half of the 400,000 trees had not yet reached bearing age. The climate is perfect, but the water supply is deficient, so that the orchards must be irrigated. The fruit is one of the most important grown in the United States, since in addition to its value in food drink, the citric acid of its juice is used upon a commercial scale by calico-printers, who by its aid remove iron from patterns stamped with certain dyes; and the oil or extract distilled from the rind is serviceable in perfumery, for flavoring, etc.

Owing to its spreading habit the tree must be carefully pruned, else it will make the necessary cultivation impossible and will result in bearing fruit at or near the ends of long willowy branches. The trees are usually set about 20 feet apart each way, given clean cultivation and fertilization like the orange (q.v.). The fruit, which ripens during the winter is cut, not pulled, green as soon as it is two and one quarter inches in diameter, the picker carrying a gauge. These details have been found necessary since lemons ripened on the tree are of inferior quality and will not keep well, and since the market demands lemons in the summer. The fruit is spread in shallow trays and stored in a well ventilated curing house where by careful management it develops the characteristic yellow skin, which also becomes tougher, thinner, more pliable and silky and less liable to injury in handling. When properly managed, lemons are profitable, and because of the constant demand are more reliable than any other of the citrus fruits.

Lemon Oil, a volatile oil obtained, by pressure, from lemon peel. It consists chiefly of a terpene, $C_{10}H_{16}$, known as limonene, which boils at 349° F., and closely resembles citrene, though differing from it in certain essential particulars. Lemon oil has an agreeable odor, and is used chiefly as a flavor and perfume. It is reputed to change spontaneously into turpentine upon keeping, but this belief probably has no foundation in fact. Lemon oil mixes in all proportions with glacial acetic acid and with absolute alcohol.

Lemon Vine. See Barbados Gooseberry.

Le Moyne, Antoine, äṅ-twän le-mwän, Sieur de Châteauguay, French soldier and colonist in America: b. Montreal 7 July 1683; d. Rochefort, France, 21 March 1747. He was a son of Charles Le Moyne (1626–85) (q.v.). He entered the French army, and in 1704 came to Louisiana with a company of settlers. In 1705–6 he fought under D'Iberville against the English, in 1717 was appointed commandant of the French forces in Louisiana, and in 1718 king's lieutenant of that colony. With the aid of Indians he captured Pensacola from the Spanish 14 May 1719; but he surrendered it 7 August. Having been held as a prisoner of war until July 1720, he took command at Mobile upon the conclusion of the peace of that year, but returned to France in 1726. He was governor of Martinique in 1727–44, and from 1745 of Cape Breton.

Le Moyne, Charles, shärl, Sieur de Longueuil, French settler, soldier, and proprietor in America: b. Dieppe, France, 1626; d. Villemarie, Canada, 1685. He came to Canada in 1641, settled at Villemarie, and was interpreter between the Hurons and the colonists. In 1651 he successfully defended the fort from an attack by the Iroquois, whom he routed with great slaughter; and in 1653 he concluded a peace with the Five Nations. These Indians, however, in 1655 again made an attack upon the colony, which was saved from destruction largely by Le Moyne's exertions. In 1657 Le Moyne received from François de Lauzon, who held 60 leagues of land under royal grant, full seignorial rights; and in 1664 his possessions were largely increased by the cession of Isle St. Hélène and other tracts. He participated in the expedition led by Tracy and Courcelles in 1666–7, and in several campaigns against the Iroquois; and for many years was captain of Montreal. He was made Sieur de Longueuil in 1668, and to this title that of Châteauguay was later added.

Le Moyne, Charles, 1st Baron de Longueuil, French soldier in America: b. Villemarie, Canada, 10 Dec. 1656; d. there 8 June 1729. He was a son of Charles Le Moyne (1626–85) (q.v.). He entered the French army, with which he served in Flanders, but returned in 1683 to Canada, where he became mayor of Montreal. He promoted colonization in Canada, and built a stone fort on his estates at Longueuil. In the campaign of 1687 against the Iroquois he was commander of a division of militia; and in 1690 he was wounded at the repulse of Phipps' attack on Quebec. He was made baron and governor of Montreal in 1700 for services to the colony; commanded the Canadian forces at Chambly, when the English made an unsuccessful attempt to take Montreal; and in 1711 became commander-in-chief of the colonial troops. He commanded at Three Rivers in 1720, and was again governor of Montreal in 1724–6. In 1726 he rebuilt Fort Niagara.

Le Moyne, Jacques, zhäk, Sieur de Sainte Hélène, French soldier in America: b. Villemarie, Canada, 16 April 1659; d. Quebec October 1690. He was a son of Charles Le Moyne (1626–85) (q.v.). In March 1686 he accompanied the expedition led by the Chevalier de Troyes against the English on Hudson Bay, and in the capture of Forts Rupert, Monsipi, and Quitchitchonen, and the seizure of the English governor-general, took a prominent part. He was second in command of the expedition that captured, plundered and burned Fort Corlear (now Schenectady) 9 Feb. 1690. In October Phipps laid siege to Quebec, and Le Moyne was selected to direct the defense. He was mortally wounded while leading about 200 troops in the repulse of 1,300 British at the passage of the St. Charles.

Le Moyne, Jean Baptiste, zhŏṅ bäp-tēst, Sieur de Bienville, French administrator in America: b. Villemarie, Canada, 23 Feb. 1680; d. Paris 1768. He was a son of Charles Le Moyne (1626–85) (q.v.). In 1691, upon the death of his brother, Charles, Baron de Longueuil (q.v.), he succeeded to the title; but he was known as De Bienville. In 1697 he served in the expedition of the Chevalier de Troyes against the English settlers in Hudson Bay. He afterward went with his brother, D'Iberville (see Iberville) to France, and 24 Oct. 1698, sailed from Brest in the expedition led by D'Iberville to take possession of the mouth of the Mississippi. Bienville was appointed lieutenant of the king, explored the surrounding region, and in 1700 became commander of a fort on the river 44 miles above its mouth. He succeeded Sauvolle in the direction of the colony, and assumed command of the camp of Biloxi 22 Aug. 1701. In December he transferred the settlement to Mobile, which prospered through the arrival of recruits from France with supplies (1703–4) and of 50 Canadians (1706). In February 1708 he was ordered to France as a prisoner, but he was later reinstated. The attempt to cultivate the soil by Indian labor having been unsuccessful, he suggested to the king in 1708 the importation of negroes from the Antilles, to be exchanged for Indians at the rate of three Indians for two negroes. In 1713 Cadillac arrived as governor, and Bienville was commissioned lieutenant-governor. Bienville led an expedition to the territory of the Natchez Indians in 1716, built a fort, and concluded a treaty. In 1718 he became governor of Louisiana, in the same year founded New Orleans, which was made the seat of government in 1723, in 1724 went to France to answer charges preferred against him, but in 1733 returned as governor with lieutenant-colonel's rank. After unsuccessful campaigns against the Chickasaws in 1736, 1739, and 1740, he sailed for France in 1743.

Le Moyne, Joseph, zhō-zĕf, Sieur de Sérigny, French soldier in America: b. Villemarie, Canada, 22 July 1668; d. Rochefort, France, 1734. He was a son of Charles Le Moyne (1626–85) (q.v.). He entered the French navy, and in 1694 and 1697 commanded the flotilla which co-operated with his brother, D'Iberville (see Iberville) in the expedition to seize Hudson Bay. Later he received command of a squadron, took to Louisiana Canadian settlers, and surveyed (1718–9) the coast of that colony. He drove the Spaniards from their fortifications at Pensacola (15 June 1719), and repulsed them at Dauphin Island, near Mobile (19 August); became a captain in 1720; and in 1723 rear-admiral. From 1723 he was governor of Rochefort.

Le Moyne, Paul, pōl, Sieur de Maricourt, French soldier in America: b. Villemarie, Canada 15 Dec. 1663; d. there 21 March 1704. He was a son of Charles Le Moyne (1626–85) (q.v.). He participated in Troyes' expedition against the English at Hudson Bay, was wounded in the attack on Fort Monsipi (20 June 1686), and remained with his brother D'Iberville (see Iberville) in command of the captured district until 1690. In 1690 he distinguished himself in the defense of Quebec against Phipps, later took part in Frontenac's expedition against the Iroquois, and in 1701 concluded peace with them.

Le Moyne, Paul Joseph, pōl zhō-zĕf, Chevalier de Longueuil, French soldier in America: b. Canada 17 Sept. 1701; d. France 12 May 1778. He was the son of Charles Le Moyne (1656–1729) (q.v.). He entered the French army in 1718. He commanded at Fort Frontenac, and was also governor successively of Detroit, Three Rivers, and Quebec. He fought with distinction in various campaigns, and in 1747 marched 180 miles in the depth of a severe northern winter to reinforce de Vaudreuil at the siege of Fort George.

Le Moyne, Pierre. See Iberville, Pierre Le Moyne Sieur d'.

Lempa, lĕm'pä, San Salvador, a river, the largest of Central America, which rises in Lake Guija on the boundary of Guatemala and San Salvador, flows eastward through a broad and fertile valley for a distance of nearly 150 miles, and then turning abruptly to the south breaks through the volcanic coast range of mountains, and finishes its course of over 200 miles in the Pacific in lat. 13° 12' N., lon. 88° 41' W., 35 miles southeast of San Salvador City. It has numerous large tributaries and is subject to sudden floods. The mouth of the river is obstructed by a bar, but the river is reached by a natural channel connected with the Jaltepeque estuary, and is navigable by small steamers for 100 miles.

Lemprière, John, English classical scholar: b. island of Jersey about 1765; d. London 1 Feb. 1824. He was graduated at Oxford University in 1790, was ordained and began life as a schoolmaster. He afterward was appointed to the livings of Mesth (1811), and Newton-Petrock (1823). He is the author of the well-known classical dictionary (1788), which was founded on Sabatier's ‘Dictionnaire des Auteurs Classiques.’ He also published: ‘Sermons’ (1791); ‘Translation of Herodotus,’ first volume only (1792); and ‘Dictionary of Universal Biography’ (1808).

Lemures, lem'ū-rēz, among the ancient Romans, a term applied to departed spirits, especially those of ancestors who hovered about during the night. Probably the word was derived from the festival *Lemuria* held 9, 11 and 13 May, when at midnight the father of the family, with special ceremonies, nine times threw black beans over his head, thus banishing the spirits from the household for another year.

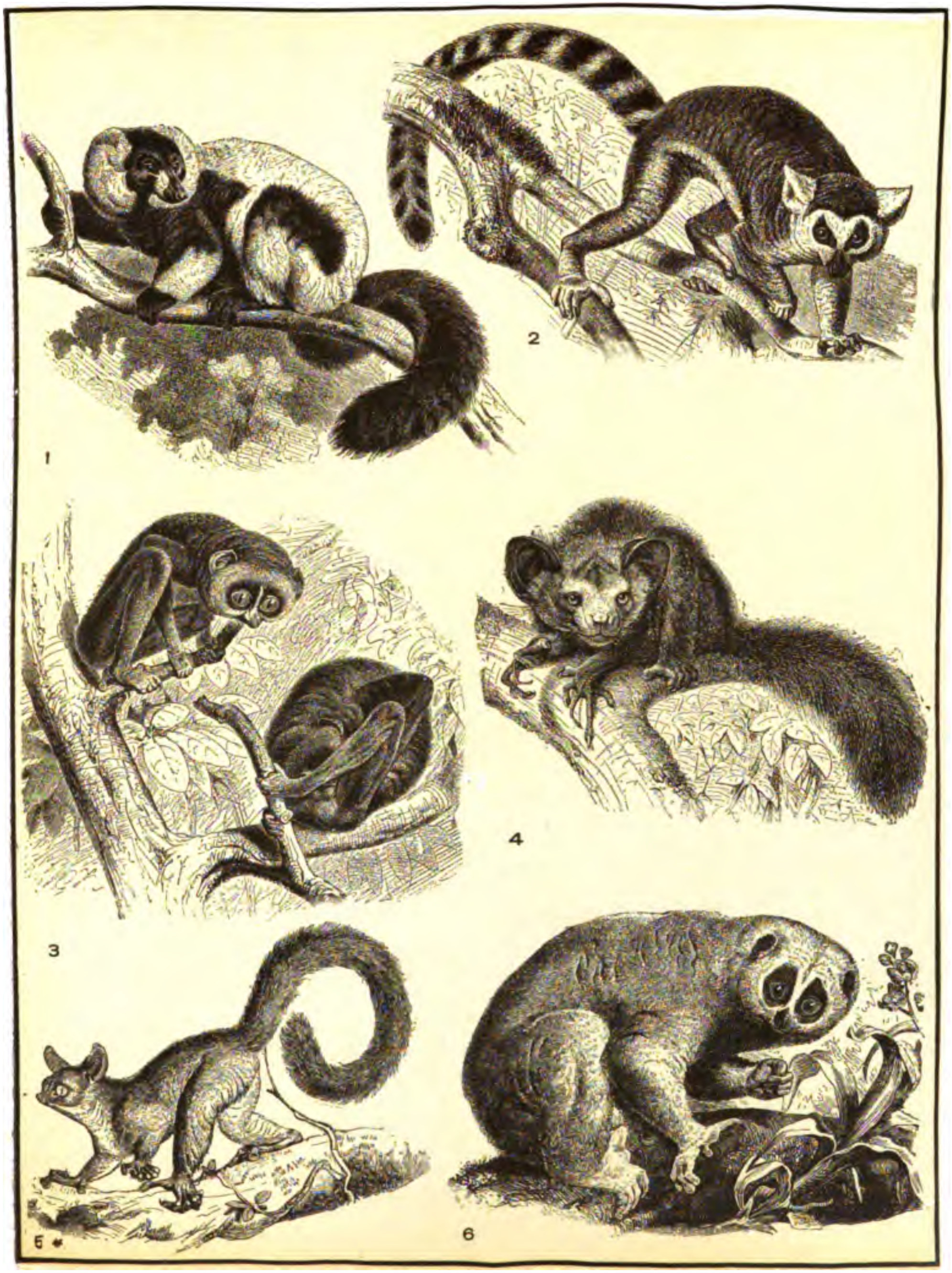
Lemu'ria, a name given by Haeckel to a vast area assumed to exist in past ages over the area of the present Africa, Indian Ocean and Malayan archipelago, on the hypothesis that the existence of such a continent was necessary to explain the peculiar present distribution of the lemurs and other phenomena of geographical distribution. The discovery of the remains of lemurs in America and Europe rendered such hypothesis futile, and the idea was soon abandoned. Consult: Wallace, ‘Geographical Distribution of Animals’ (1876).

Lemurs, lē'mėrz, the curious monkey-like animals, or «half-apes» forming the group *Lemuroidea* within the order Primates, where they stand lowest in rank. They are divisible into three families, *Lemuridæ, Tarsiidæ* and *Chiromyidæ*. The last contains only the aye-aye (q.v.); and the second only the Malayan tarsiers (q.v.). The lemurs proper (*Lemuridæ*) are confined mainly to Madagascar, but a few are found upon the African continent, and a few others, of peculiar genera, in the Oriental region. They are chiefly arboreal, and more squirrel-like than monkey-like in their manners, and quite harmless, gentle and tamable. They are usually mouse-gray or yellowish, not marked in ornamental ways, the hair is long and often woolly, and the tail usually long, bushy and never prehensile. The hind-legs are longer than the fore-legs in the true lemurs, which move about on all fours, not using their hands as do monkeys, although the thumbs are opposable; the second toe always has a sharp claw, while the other digits bear nails. In the internal anatomy many features are different from the rule of structure elsewhere in the order. The simplicity of the brain, the fact that certain arteries form retia mirabilia, and especially the nondeciduate condition of the placenta, are prominent among these lemuroid peculiarities. In general, however, the lemurs show much resemblance to the *Anthropoidea*.

The *Lemuridæ*, or lemurs proper, are divisible into four groups or sub-families. The first group (*Indrisinæ*) is limited to Madagascar, and includes several genera distinguished prominently by the great size of the hind-legs, as compared with the fore-limbs; and when upon the ground these lemurs walk erect, balancing themselves by holding their short arms above their heads. The largest is the indri (q.v.), which has no visible tail, while the smallest are the avahis (genus *Avahis*) which are the size of gray squirrels, but have very long tails. A third important genus is *Propithecus*, containing several large brightly colored species, called sifakas, which are mainly vegetarian, go about in large bands like the indris, and seek food in the daytime, whereas the avahis are nocturnal; and are often tamed and taught to hunt like dogs.

The most typical lemurs are in the sub-family *Lemurinæ*, which contains several genera, some of which inhabit the Comoro Islands as well as Madagascar. Their limbs are of nearly equal length, and they have a fuller dentition (36 teeth). Among the best known are the so-called «gentle» lemurs; the nocturnal grass-eating bokomboulis (*Haplemur*); and the handsome and highly arboreal species of the type-genus *Lemur*, which vary greatly in habits, food and appearance. One of these is familiar as the «Madagascar cat» or ring-tailed lemur (*L. catta*), since, unlike the rest, it remains upon the ground, especially about rocks, is easily caught and readily tamed. It is remarkable for the fact that the sexes differ in color, the male being black, while the female is reddish brown with white whiskers and ear-tufts, and the tail alternately ringed with brown and white. The

LEMURS.



1. Ruffed Lemur.
2. Ring-tailed Lemur.
3. Slender Loris.
4. Ayeaye.
5. Great Galago.
6. Common Loris.

ruffed lemur (*L. varius*) is still more strikingly diversified in black and white, and has a ruff of long hair about the neck. All these lemurs survive captivity well and furnish interesting specimens for all zoological gardens.

The third sub-family is that of the *Galaginæ*, represented in the continent of Africa and in Madagascar. The galagos (q.v.) have long hind-legs, causing them to hop like kangaroos, when on the ground (but the most of their life is passed in trees), large, semi-naked ears and long tails. Important genera are *Galago* (q.v.); the mouse-lemurs or chirogales (q.v); and the diminutive squirrel-like dwarf-lemurs (*Microcebus*).

The sub-family *Lorisinæ* contains a group of small lemurs, distributed widely in Africa, India, and Malaysia. «In external appearance,» remarks Beddard, «all the three genera of this sub-family agree in their small size, their short or entirely deficient tail, large staring eyes, and the rudimentary character, or absence, of the index finger, which is never provided with a nail; in all of them the thumb diverges widely from the other fingers, and the great toe is so divergent as to be directed backward.» The ears are small and rounded; and the eyes are very large, and situated close together on the front of the head. They feed on small birds and insects, and are chiefly nocturnal in habits. They inhabit India, Ceylon, and the Eastern Archipelago. The genus *Nycticebus* contains the remarkable «sloth monkey» or sloth lemur (*N. tardigradus*), which is nocturnal, howls dismally at times, and is the object of many fears and superstitions among the Malays and southern Chinese. The genus *Perodictus* contains the queer African pottos and angwantibos (q.v.). The most typical species of the group is the slender loris (*Loris gracilis*), a pretty little arboreal animal of the Malayan countries, and the subject of many fears and curious superstitions among the Malays and southern Chinese.

The geographical and geological distribution of the lemurs is very interesting. Their remains are found in the rocks as far back as the transition period (Puerco beds) between the Cretaceous and Tertiary, the oldest occurring in the western United States. These are small lemuroids, and similar forms are found in the early Tertiary rocks of Europe, Asia, and Africa. Many genera are known. The most recent, which may have survived in Madagascar until the discovery of that island by Europeans, was *Megaladapis*, which must have been three or four times bigger than any modern species. The circumstance that existing lemurs and certain other animals occur only in south-central Africa, Madagascar and the Oriental region, and nowhere between, was so extraordinary a fact in zoogeography that early attempts to account for it resulted in the hypothesis of an ancient continental land-area, called *Lemuria* (q.v.) which was supposed to connect Africa and southern Asia. This theory had little other foundation, and the subsequent discovery of remains of extinct lemurs in Europe, Western Asia, and the two Americas, showed that it was needless. It is evident that the existing lemurs are the survivors of a once world-wide race which has died out except in certain islands and favorable corners of the world where they are not exposed to cold climates nor to too many enemies. The almost complete absence of predatory animals in Madagascar doubtless explains the comparatively great number of lemurs characteristic of that isolated country.

Consult: Beddard, ‹Mammalia› (1902); Forbes ‹Allen's Naturalists' Library› (1894); Lydekker, ‹Royal Natural History,› Vol. I., (1893); Mivart and Murie ‹Anatomy of the Lemuroidea,› in Trans.-Zool. Soc. of London, Vol. VII. (1872).

Lena, lā-nä' or lĕ'na̤, Siberia, one of the largest rivers in the world, rising on the northwestern side of the mountains which skirt the western shore of Lake Baikal, about 170 miles east-northeast of Irkutsk. It flows in a winding course, north-northeast and northwest, receiving the Vitim, the Aldan, the Viliui, and other tributaries. Then a mighty stream it flows generally north, till, separating into branches, it forms a great number of deltaic islands, and discharges itself into the Arctic Ocean by several mouths, in lat. 73° N., and lon. about 128° E., having thus passed over 21° of lat. and 22° of lon. Its direct course, through a generally barren country interspersed with a few dense forests, is about 1,480 miles; its actual course, windings included, about 2,770 miles. It is navigable through the greater part of its course, but is frozen from October to May.

Lenâpé (lĕn'a̤-pā) **Stone**, in archæology, a name given by H. C. Mercer to an inscribed gorget, upon which was incised a spirited combat between men and a mastodon; lightning intervening and aiding the men in the destruction of the beast. The stone told pictorially the legend recorded by Jefferson in his ‹Notes on Virginia.› Since its discovery the stone has been condemned by most archæologists, and not always on the same grounds, and it is probable that it will not be accepted generally as genuine until abundant corroborative evidence has been obtained. If genuine, the stone establishes two most interesting facts concerning the Indians of the Atlantic seaboard; that the mastodon or mammoth was living when these people were at the climax of their cultural development, or, if not a feature of practically our present fauna, then that the advanced Indian lived at a much more remote period than is generally supposed. The evidence now had concerning the mastodon is that it was living about 2,500 years ago, and this antedates the Indian as so advanced an occupant of this region. That man has been an occupant of our seaboard region since the Glacial Epoch is demonstrable, and his contemporaneity with so recently extinct an animal as the mastodon is certain. The principal objection that can be brought against its genuineness is that it is so far in advance of all other known specimens of Indian pictographic art.

C. C. Abbot.

Lenbach, Franz von, fränts fōn lĕn'bäH, German painter: b. Schrobenhausen, Upper Bavaria, 13 Dec. 1836; d. Munich 19 May 1904. He began life as a bricklayer, but at the suggestion of Hofner, the animal painter, turned to the study of art, and became a pupil of Geyer in Augsburg. He subsequently attended the Munich Academy for a short time, and then for two years studied the technique of painting under Gräfle. From 1855 to 1857 he lived as one of the artistic coterie of

Schrobenhausen, and painted portraits, landscapes, and animals. He then attached himself to Piloty, and as the pupil of that artist accompanied him to Rome. Here he applied himself to the study of the old masters and painted his picture ‹The Roman Forum,› whose vivid coloring and grandeur of design made his reputation. After his return to Germany he painted several portraits, which were distinguished by a power of coloring rivaling that of the Venetian school, and a vivid characterization and chiaroscuro which recalled Rembrandt. He was for a few years teacher in the Weimar school of art, but eventually returned to Munich, and attracted the attention of Baron von Schack, who engaged him to visit Italy and Spain for the purpose of making copies of the principal paintings of Giorgione, Velasquez, Titian, Rubens and others. The copies executed by the painter have all the individual tone and color of each original, and he developed immensely his own power and style by their production. This appears most plainly from an examination of his portraits which, original and fresh as they are, show plainly that the master had trained himself in the school of Titian, Rembrandt and Velasquez. Though his drawing is sometimes weak and incorrect, his paintings nevertheless are characterized by powerful modeling, life-like expression, and as a portrait painter he sees to the soul of his sitter with genial and sympathetic intuition. Since his 70th year he has produced an extraordinary number of pictures. He painted the Emperor William in the last year of that monarch's life; he also executed several portraits of Bismarck, and Von Moltke, whose features have become familiar to the world largely from the numerous reproductions of these inimitable pictures, now looked upon as classic examples of German art. Bismarck especially appears in these canvases in every attitude and costume civil and military which he assumed. Many of these portraits are in the picture galleries of Berlin. But he painted in his time every living man of eminence in Europe from Gladstone to Leo XIII. He also executed many pastel portraits as well as single ideal figures (‹Sakuntala,› ‹Herodias,› etc.). He was a Royal Bavarian professor. A collection of heliogravure reproductions of his paintings was published at Munich in 1891.

Lenclos, lŏṅ-klō, **Anne,** French courtesan, better known as Ninon de Lenclos; b. Paris 15 May 1615; d. there 17 Oct. 1705. She was famed for her beauty and notwithstanding her reputation, some of the most respectable ladies of the time cultivated her friendship, and in her old age her house was the rendezvous of the most distinguished personages of the city and court. Scarron consulted her on his romances, St. Evremond on his poems, Molière on his comedies, Fontenelle on his dialogues, and La Rochefoucauld on his maxims. Richelieu is said to have been her first lover, and Coligny, Condé, Sévigné, etc., were her lovers and friends. She retained the charms of her manners and conversation, and to some extent of her person, to extreme old age.

Lend a Hand Clubs, organizations of young persons established in the United States in 1871, for religious, philanthropical and social purposes. The name is derived from a story by Edward Everett Hale, entitled ‹Ten Times One is Ten,› published in 1870. Each club creates its own constitution but follows a common motto:

Look up and not down,
Look forward and not back,
Look out and not in,
Lend a hand.

The badge of the club is a Maltese cross, with the inscription «In His Name.»

Lenepveu, lā-nā-vė, **Charles Ferdinand,** French composer: b. Rouen 1840. A pupil of Savard, Ambroise Thomas, and Chauvet, he obtained the Prix de Rome in 1865, and was appointed professor of harmony at the Conservatory in 1881 and of composition in 1893. His works include the sacred drama ‹Jeanne d'Arc,› first given in the cathedral of Rouen in 1886, several operas, a requiem mass, ‹Méditation› for orchestra, and various choral and solo compositions.

Lenepveu, Jules Eugène, zhül ė-zhān, French painter: b. Angers 1819; d. 1898. He was a pupil of Picot and the Beaux-Arts, won the Prix de Rome in 1847, painted several canvases (‹Les Martyrs aux Catacombes›; ‹Venetian Night›; ‹Hylas›; and others), and executed many frescoes in public buildings at Paris, Angers, and elsewhere.

L'Enfant, lŏṅ-fäṅ, **Pierre Charles,** French-American engineer: b. France 1755; d. Prince George's County, Md., 4 June 1825. A lieutenant in the provisional service of France, in whose best military institutions he had been trained, he came to America with Lafayette in April 1777; built Fort Mifflin (on the Delaware), which successfully resisted one of the most vigorous attacks of the Revolutionary War; and by his skill as a designer of fortifications attracted the attention of Washington, who made him chief of engineers, with brevet of major of engineers. He remodeled and refitted the City-hall in New York for the use of the first Congress, and later also the Federal House in Philadelphia. Washington and Jefferson selected him to draw the plan for the «new federal town»; and during the spring and summer of 1791 he was employed in the elaboration of his plans. Jefferson wished the design to be that of a chess-board regularity of squares; but L'Enfant broke the monotony of this arrangement by inserting numerous avenues running at acute angles. His plan was approved by Washington, and he was retained to direct the execution of it. The commissioners in general charge of the work advertised a sale of lots for October 1791, and requested L'Enfant to furnish his plan to be engraved and published. This he refused to do, asserting that speculators would purchase the best locations in the «vistas and architectural squares,» and «permanently disfigure the city» by «huddles of shanties.» For this insubordination Washington ordered his dismissal 1 March 1792. For planning the «federal city» and devoting his time for months to the survey and other preliminary operations, L'Enfant received only $2,500 and a lot near the executive mansion, a compensation quite in accord with the general economy with which the work was prosecuted. He requested the commissioners to recall the order for the money and «not take any further trouble about the lot.» Later, Madison appointed him professor of engineering at West Point, but he declined the post. He designed several public works at Philadelphia, and was appointed to construct the present Ft. Washington (on the Potomac). He partly executed the work, but disagreed with his superiors, and was dismissed. He lived latterly at Chellum Castle, the residence of Dudley Digges, near Bladensburg, Md., and frequented the halls of Congress, seeking in vain for a reward for past services. The execution of his plan for Washington was continued by his assistant, Andrew Endicott, later professor of mathematics at West Point. L'Enfant's design may be viewed in the Library of Congress. To L'Enfant is chiefly due the fact that to-day Washington is one of the most picturesque cities of the world. See WASHINGTON.

Lenno Lenapes, lĕn'nō lĕn'ạ-pēz, the native name for the Delaware Indians (q.v.).

Len'nox, Charlotte Ramsay, English novelist: b. New York 1720; d. London, England, 4 Jan. 1804. She was the daughter of the lieutenant-governor of New York and was educated in England. She married and being left a widow in narrow circumstances took up literature for support. Her best work is 'Shakespeare Illustrated' (1753-4). She also wrote 'Memoirs of Harriet Stewart' (1751); 'The Female Quixote,' popular in its day (1752); 'Sophia,' a novel (1763); 'The Sisters,' a comedy (1769); etc. She was the friend of Dr. Johnson and Samuel Richardson, from the former of whom she received much literary encouragement.

Lenormant, Charles, shärl lĕ-nôr-mäñ, French archæologist and art historian: b. Paris 1 June 1802; d. Athens, Greece, 24 Nov. 1859. He became inspector of fine arts in 1825, professor at the Sorbonne in 1835 and was professor of Egyptian archæology in the Collège de France from 1848 till his death. Among his writings are: 'Thesaurus of Numismatics and Glyptics' (20 vols., 1834-50); 'Introduction to Oriental History' (1838); 'Museum of Egyptian Antiquities' (1835-42); 'Selection of Keramographic Monuments' (4 vols., 1837-61); 'Historical Questions' (2d ed. 1854).

Lenormant, François, fräñ-swä, French historian and archæologist, son of Charles Lenormant (q.v.): b. Paris 17 Jan. 1837; d. there 10 Dec. 1882. He is one of the foremost of French Assyriologists and from 1874 was professor of archæology at the Bibliothèque. Among his very numerous works are: 'Archæological Researches at Eleusis' (1862); 'Ancient History in the East' (1868-9); 'Letters on Assyriology' (5 vols., 1871-9); 'Akkadian Studies' (3 vols., 1873-9); 'The Primitive Language of Chaldea' (1875); 'Money of Ancient Times' (1879); 'The Beginnings of History according to the Bible' (3 vols., 1880-4); 'Magna Grecia' (1881-3).

Len'ox, James, American philanthropist: b. New York 19 Aug. 1800; d. there 17 Feb. 1880. He was educated at Columbia, and in 1839, on the death of his father, a wealthy Scottish merchant of New York, he inherited a fortune of several millions, and 30 acres of land between Fourth and Fifth avenues. After his father's death he retired from business and devoted his time to study, and the collection of fine books, statuary and painting. After some years he became the possessor of the most extensive private collection of books and paintings in the United States. In 1870 he erected a large and costly building on Fifth Avenue, between 70th and 71st streets, to contain his collection, and this now constitutes the Lenox Library, which he gave to the city on its completion. It is especially notable for its exceptionally large collection of Americana. He founded the Presbyterian Hospital near the library, his gifts to it amounting to $600,000. He also made important gifts to Princeton College and seminary, and gave liberally to numerous churches and charities connected with the Presbyterian Church.

Lenox, Mass., town in Berkshire County; on the New York, N. H. & H. railroad; about six miles south of Pittsfield and the same distance from the boundary line between New York and Massachusetts. It was settled in 1750 and named in honor of Charles Lenox, Duke of Richmond. The town includes the villages of Lenoxdale and New Lenox. It is noted for its beautiful scenery and healthy climate. Within the town limits are Laurel and Mahkeenac lakes, and spurs of the mountains called the Ledge, Perry Peak, Bald Head, and Mattoon Hill. This locality is largely residential; the industries which contribute to the wealth of Lenox are located mainly in the large cities. Many noted people have been residents of Lenox, among others Nathaniel Hawthorne. Pop. (1900) 2,942.

Lenox College, a coeducational institution, founded at Hopkinton, Iowa, in 1850, and opened in 1859, under the auspices of the Presbyterian Church. It has a preparatory department and classical courses leading to degrees. In 1903 there were connected with the school 15 instructors, and 170 students. The library contains nearly 6,000 volumes.

Lens. A transparent body, generally glass, which refracts the rays of light convergently or divergently. Converging lenses, properly speaking, are called positive (trade designation plus, +), because they bring rays of light to an actual focus, thus forming a real image. Converging lenses give, under suitable conditions, a magnified image of an object, and one or both of their bounding polished surfaces are convex. The fact of their being thicker in the middle than at the edges distinguishes them from diverging lenses. Diverging lenses are called negative (trade designation, minus, —) because they tend to cause the rays of light to diverge and form, under all conditions, a virtual, reduced image of an object. One or both of their surfaces are concave and they can be distinguished from converging lenses by their being thinner in the middle than at the edges. These two classes of lenses are each divided into three leading types. Those of the positive or convex class are (1) double or bi-convex; (2) plano convex; (3) convex meniscus (trade term, periscopic convex). Those of the negative or

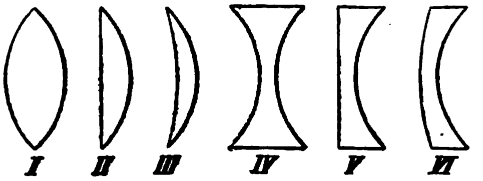


FIG. 1.

concave class are: (4) double or bi-concave; (5) plano concave; (6) concave meniscus (trade term, periscopic concave). (See Fig. 1.) Convex lenses converge parallel rays, as shown in Fig. 2, to a point (*c*) called the principal focus or focal point, and the distance from a certain point (*b*), called a principal point, which is usually within the lens, to the focal point (*c*) is the equivalent focal length. The straight line (*d b c*) which passes through the middle of the lens, joining the centres of the curvature of the two surfaces, is called the principal axis.

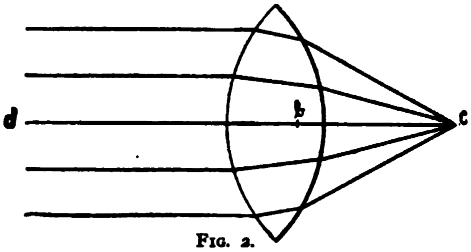


FIG. 2.

For brevity, the word "focus" is often used instead of focal length. In a concave lens, the action on parallel rays is opposite to that of a convex lens; instead of converging the light, it diverges the rays away from the axis, as shown in Fig. 3. The imaginary extension of the diverging rays should meet at *c*, and when, as in the case of the convex lens, the incident rays are parallel, the distance from the virtual focus *c* to the principal point *b* is the equivalent focal length. Generally speaking, the real or virtual focus increases with the increase of radius of curvature of the polished surfaces. The power of any lens is the quotient obtained by dividing unity by the equivalent focal length. A lens is said to be neutralized when combined with one of equal and opposite power, giving the effect of a plane glass. The distinctness of the image formed by a simple lens depends mostly on the extent to which the spherical aberration and the chromatic aberration are present, the aberrations being greater as the ratio of diameter to focal length increases in a lens of any given type. Spherical aberration of a lens is caused by the rays meeting at different intervals along the axis instead of combining at one point. In Fig. 4, *ol* is the spherical aberration. Chromatic aberration is due to the separation of the light into its different colors, thus causing, in the case of a convex lens, the violet rays to meet at a point *v* nearer the lens than do the red rays at point *r*. In Fig 5, *vr* is the chromatic aberration. Both of these defects are corrected by means of achromatic lenses.

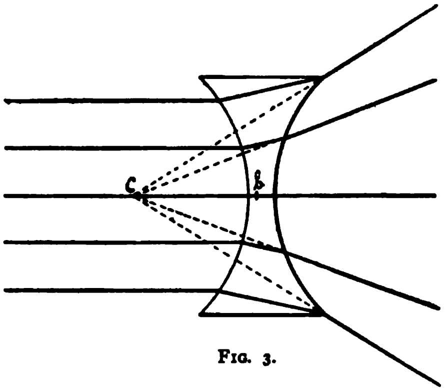


FIG. 3.

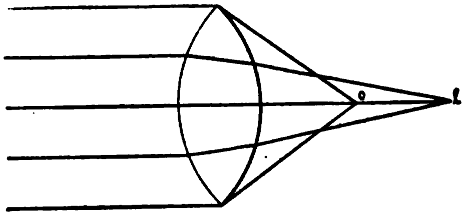


FIG. 4.

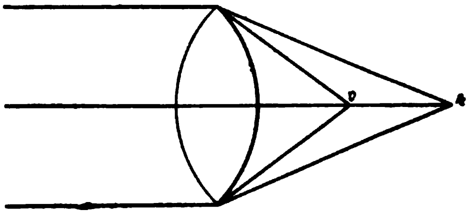


FIG. 5.

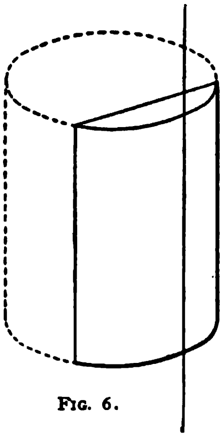


FIG. 6.

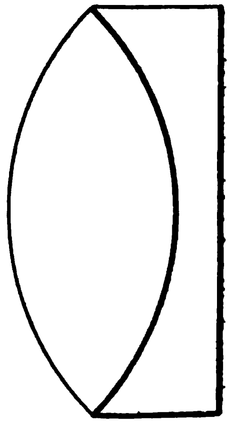


FIG. 8.

Up to the present, we have only considered lenses in which the curved surfaces are spherical, and for this reason are called spherical lenses. There are, however, other forms of lenses used, especially for the correction of defects in vision, principally astigmatism, of which the most important has one, sometimes both, of the curved surfaces cylindrical. These are called cylindrical lenses, or cylinders. In these lenses a line drawn along the summit of curvature, parallel to the axis of the imaginary cylinder is called the axis, and must be distinguished from the principal axis of a spherical lens. (Fig. 6.) When the lens has two cylindrical surfaces, with the axes at right angles, it is called a "crossed cylinder"; if one of the surfaces is spherical and the other cylindrical, the lens is called a "sphero-cylinder." Another form of lens which has come into use in recent years is the toric (toroidal) lens on which one surface is toroidal, the meridians of the surface are at right angles to each other and have radii of different curvature. Its form is illustrated by a section of a bicycle tire. (Fig. 7.)

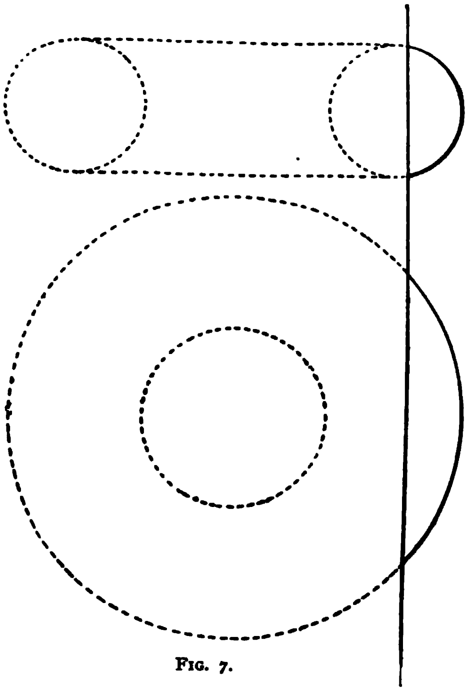


Fig. 7.

History.— The word lens is frequently used to designate a combination of lenses, or of lens-systems, as for example a photographic objective is often called a «photographic lens.» The early history of lenses is quite vague. While the magnifying property of glass globes filled with water and presumably of glass beads was known, there is no authentic information that lenses were made and used. There is in the British Museum a piece of rock-crystal about the size of a modern spectacle lens, cut to a plano convex form which was found by Layard during the excavations at Nimroud. Instead of having a spherical surface, it is made up of a series of facets and the crystal is permeated by cloudy striæ. Alhazen, who died about 1052, first described the magnifying effect of simple lenses. Spectacle lenses were well known in the 13th century, and their invention is credited to Salvino d' Armato degli Armati, about 1255. The combination of two single lenses, thus forming a compound microscope, for the purpose of magnifying objects, is believed to be due to Hans and Zacharias Janssen of Middleburg, Holland, about 1590. The discovery of the telescope which is credited to Galileo about the year 1610 was in its original form a combination of a convex lens of long focus with a concave lens of short focus, and this form is still retained in the ordinary opera glass, which is designated as a Galilean telescope. The achromatic lens was the next important invention and was made by Dolland in England in 1758.

Achromatic lens.— In its simplest form is a combination of a converging crown glass lens and a diverging flint glass lens so proportioned that the chromatic aberration is corrected for two colors. These lenses are generally combined by a thin transparent cement which makes them together appear as one lens. (See Fig. 8.) They are also made up of three, four or five lenses.

Aplanatic lens.— A lens or a lens system which is free from spherical aberration.

Apochromatic lens.— An achromatic lens in which the chromatic aberration is corrected for three colors and the spherical aberration is also very perfectly corrected.

Bi-focal lens.— A double focus spectacle lens first introduced by Benjamin Franklin, and now commonly made by adding to or inserting a segment in the lower half of the lens.

Bull's-eye lens.— A plano convex lens of relatively short focus used for illuminating purposes.

Cataract lens.— A short focus convex lens to aid vision after the removal of the crystalline of the eye for cataract.

Coddington lens.— Originally the central portion of a glass sphere but is now generally made a single lens of considerable thickness with convex surfaces, with a circular groove to cut out the marginal rays.

Collective lens.— In a microscope or telescope eyepiece the large lens nearest the objective.

Compound lens (A trade term).— A lens in which combinations of plano, spherical, cylindrical or toric surfaces are made, sometimes to the extent of obtaining a prismatic effect.

Condensing lens.— A convex lens or a system of lenses for concentrating light to a point or on a surface.

Coquille lens (Trade term).— A piece of colored glass of uniform thickness and having concentric spherical surfaces.

Crossed lens.— Either a double convex or double concave lens with the radii of curvature in the proportion of 1 to 6, and giving the minimum amount of spherical aberration.

Crystalline lens.— The double convex lens in the eye situated behind the iris and aiding to form the image on the retina.

Demonstration lenses.— A series of lenses of pronounced curvatures to illustrate the various types of lenses.

Doublet lens.— A combination of two single lenses.

Eye-lens.— The lens nearest the eye in eyepieces (oculars) used for microscopes and telescopes.

Eyeglass lens.— A spectacle lens used to aid vision. As a single lens it is held in position by muscular contraction. The eyeglass with lenses for both eyes is generally accepted to mean the form which is held in position by clamping the nose (French, pince-nez).

Finder lens.— A lens or a combination of lenses attached to a camera to locate an object in the field of view.

Fluid lens.— A lens produced by filling the space formed by two surfaces of transparent media with a suitable media.

Fresnel lens.— A lens formed of a central plano convex or toric convex lens bounded by ring-shaped prisms and lenticular prisms, used to project the rays from a lamp, as in a lighthouse or signal light.

Immersion lens.— A microscope objective of high power, the front lens of which is connected by fluid to the cover glass of an object, thus giving increased angular aperture.

Magnifying lens (Magnifier).— A lens or a combination of lenses used to increase the apparent size of an object, usually mounted in convenient form for the pocket.

Pebble lens (Trade term).— A spectacle lens made of rock crystal which is harder than glass.

Photographic lens (also photographic objective).—A lens or a combination of lenses designed for photographic purposes. It is made in a great variety of types, the simplest being the single achromatic convex meniscus lens. The form in most common use is composed of two separated achromatic menisci, with their concave surfaces toward one another (symmetrical, rectilinear, aplanat). The portrait lens is another type having great light-gathering power, and is composed of two separated achromatic lenses, one cemented and the other uncemented (Petzval type). The most modern photographic lens is the anastigmat, invented by P. Rudolph, which is free from astigmatism, a fault present in all earlier types. The new varieties of optical glass made in Jena were first successfully employed in these lenses, by means of which greater perfection in other directions was also attained.

Spectacle lens.— A lens used to correct vision and when two are combined by a bridge which rests on the nose and provided with bows which clasp the temples is now generally termed spectacle. EDWARD BAUSCH,
Of the Bausch & Lomb Optical Co., Rochester, N. Y.

Lent (from Anglo-Saxon *Lenct,* spring), the spring or vernal fast of the Christian Church as observed, in preparation for Easter, by members of the Greek, Roman, and Anglican Churches. The original fast of spring which preceded Easter; was of forty hours' duration, this being the number of hours that intervened between the death and resurrection of Christ. Additional days were added, their number varying in different churches. Cassian (420 A.D.) says six or seven weeks was the period in the several churches, but none exceeded 36 fasting days. He affirms that the observance of Lent is not primitive. The historian Sozomen (440 A.D.) writes of the fast «The Quadragesimal fast before Easter some observe six weeks, as the Illyrians and Western Churches; others make it seven weeks, as the Constantinopolitans and neighboring churches.» In the first three or four centuries much latitude was allowed in the observance of Lent; Chrysostom recommends, but does not enforce it, insisting on the prior necessity of good works and alms-giving. Distinction of foods was not made in primitive times, when the greatest ascetics ate meat in Lent, though they abstained from eating until the evening. See FASTING, ASH WEDNESDAY, HOLY WEEK.

Len'til, a European leguminous plant (*Ervum lens*), closely allied to the tares and vetches. Lentils are cultivated in southern Europe in two varieties — the large garden lentil and the common field lentil, for the sake of their seeds contained in small pods. The straw of lentils is good food for cattle and sheep, and when mixed with vetches, and sowed as food, are excellent fodder. As food for man they are very nutritious, and in Egypt, Syria, etc., are a chief article of diet. They are used in soups, etc., in England and America, but not to a great extent.

Lentulus, lĕn'tū-lŭs, the name of a patrician family of Rome of the Cornelian gens. Several of its members distinguished themselves by their virtues and services, while others were less honorably conspicuous. Publius Lentulus Sura, an accomplice of Catiline, was strangled in prison. Lentulus Spinther, one of the most luxurious and ostentatious men of his age, was a partisan of Pompey, but was pardoned by Cæsar and joined Brutus and Cassius when they took the field after the assassination of Cæsar. To Gneius Lentulus was assigned the command of the legions in Upper Germany during the reign of Tiberius. He was put to death by Caligula.

Leo, lē'ō, the name of six rulers of the Byzantine empire, as follows:

Leo I., called the ELDER: b. Thrace about 400; d. 474. He ascended the throne in 457. After attaining the highest military rank, he was proclaimed emperor by the soldiers in succession to Marcianus. He confirmed the decrees of the Council of Chalcedon against the Eutychians, and renewed the war against the Vandals; but this having resulted in failure the blame was thrown upon his general, Aspar, whom he put to death with his family in 471. The Goths, to revenge the fate of Aspar, poured into the empire, which they laid waste as far as the walls of Constantinople.

Leo II., called the YOUNGER, grandson of Leo I., succeeded his grandfather under the guardianship of his father, who caused himself to be proclaimed emperor a few months afterward. He is said to have been put to death by his own father after reigning from January to November 474.

Leo III., called the ISAURIAN: b. Isauria about 680; d. 18 June 741. Entering the army he became general-in-chief of the army of Asia, under Justinian II. In 716 he marched against Theodosius III., who had been proclaimed emperor on the deposition of Justinian II.; and himself seized the crown the next year. The Saracens, under Solyman, having ravaged Thrace, laid siege to Constantinople, which was defended by Leo, who compelled them to retire. In 726 he ordered all the images in the churches of the empire to be removed, an edict which aroused the memorable contest known as iconoclasm.

Leo IV., grandson of Leo III.: b. 750; d. 780. He succeeded his father, Constantine V., in 775. In his time the controversy raged fiercely between the Iconoclasts, or image-breakers, and their adversaries, both of whom he protected by turns. He repulsed the Saracens in Asia.

Leo V., called the ARMENIAN, from the country of which he was a native, d. 25 Dec. 820. He rose to the rank of general by his valor; but was accused of treason, disgraced, and imprisoned. Michael Rhangabus, on ascending the throne in 811, restored him to his rank; but Leo, profiting by the misfortunes of his master, headed a military revolt and was elected emperor by the troops in 813. He was one of the most violent of the Iconoclastic princes and was assassinated before the altar in his palace chapel.

Leo VI., the Philosopher: b. 865; d. 911. He was the son and successor of Basilius, the Macedonian, and ascended the throne in 886. The Hungarians, Saracens, and Bulgarians having united against the empire, he asked the aid of the Turks, who entered Bulgaria and ravaged it. He drove the patriarch Photius from his seat; and Nicholas, one of the successors of Photius, excommunicated the emperor; for which Leo VI. deposed him. He wrote 'Oracula,' a poem; 'Orationes'; and a celebrated treatise on tactics, printed at Leyden in 1612. Consult: Bury, 'Later Roman Empire' (1887); Oman, 'Byzantine Empire' (1892).

Leo, the name of 13 popes, as follows:

Leo I., Saint, surnamed The Great: b. probably at Rome; d. there 10 Nov. 461. He succeeded Sextus III. in 440 and took decided action against the Manichæans and other heretics. He held a council at Rome against Eutyches in 449, and presided by legates at the General Council of Chalcedon, 451. When Attila invaded Italy, Leo I. who was sent by the Emperor Valentinian to dissuade the invader from his threatened march on Rome, was successful in his mission. He afterward saved the city from being burned by Genseric. His sermons and letters, edited by Ballerini, appeared 1753–7. Consult Arendt, 'Leo der Grosse und seine Zeit' (1835); Gore, 'Leo the Great' (1880).

Leo II., Saint: b. Sicily; d. 683. He succeeded Agatho in 682. He confirmed the decrees of the sixth general council and was instrumental in raising the grade of church music and improving the Gregorian Chant. He was succeeded by Benedict III.

Leo III., Saint: b. Rome; d. there 25 May 816. He succeeded Adrian I. in 795 and his first official act was to acknowledge the suzerainty of Charles the Great (Charlemagne) by sending him the keys of St. Peter's and the standard of the city of Rome. His rule was much disturbed by outbreaks and conspiracies in Rome and in 799 he was obliged to ask the protection of Charles. In the following year, 800, Charles visited Rome, and was there crowned by the Pope, emperor of the Romans.

Leo IV., Saint: b. Rome; d. 7 July 855. He succeeded Sergius II. in 847. The Saracens having invaded the Ecclesiastical States, he marched against them and obtained a complete victory; after which he built the Leonine wall encircling the Vatican quarter, restored the town of Porta, colonizing it with Corsicans, and founded the town of Leopolis, now deserted, some 12 miles from Civita Vecchia.

Leo V.: d. 6 Dec. 903. He was a Benedictine monk who, in 903, succeeded Benedict IV., but was imprisoned by his chaplain Christopher, and died soon after.

Leo VI.: d. 3 Feb. 929. He succeeded John X. 6 July 928, and is said to have been put to death by Marozia.

Leo VII.: d. 939. He succeeded John XI., son of Marozia. He successfully negotiated a peace between Hugo, King of Italy, and Alberic, Duke of Rome, the son of the celebrated Marozia, and is reported to have been an irreproachable man and zealous ecclesiastic. His successor was Stephen VIII.

Leo VIII.: d. 965. He was intruded in the pontificate on the pretended deposition of John XII., in 963, under the patronage of Otho I., but on Otho's withdrawal John re-entered Rome, and drove away Leo. John's death occurring soon after, Benedict V. was chosen pope. The Emperor Otho subsequently took Rome, and after the banishment of Benedict again intruded Leo, who shortly after died.

Leo IX., Saint (Bruno): b. Alsace 21 June 1002; d. Rome 19 April 1054. He was cousin to Emperor Conrad the Salic, and became bishop of Toul at 22. At the Diet of Worms, in 1048, he was elected to succeed Damasus II. as Pope. He applied himself to the reform of discipline in the Church, holding several councils against simony and concubinage. In 1058 he opposed the Normans in Italy, but was taken prisoner by their leader, Robert Guiscard, at the battle of Civitella, and confined at Benevento ten months. Falling ill he was allowed to return to Rome. Consult Hunkler, 'Leo der Neunte und seine Zeit' (1851).

Leo X. (Giovanni de' Medici, jō-vän'nē dā mā'dē-chē): b. Florence 11 Dec. 1475; d. Rome 1 Dec. 1521. He was the second son of Lorenzo the Magnificent, and his father had him made a cardinal by Innocent VIII. at the age of 13. When the Medici were expelled from Florence, in 1494, he spent some years in travel in Germany, France, and Flanders, and made acquaintance with many eminent men, returning to Rome in 1503 and devoting himself to science and the fine arts. He was appointed by Julius II. legate with the papal army, and in 1512 was taken prisoner by the French at the battle of Ravenna, regaining his liberty only after the evacuation of Milan by the French. In 1513 on the death of Julius II., he was elected Pope, and made his entry into Rome on 11 April, the anniversary of his capture at Ravenna. His pontificate of nine years is one of the most eventful of modern history, when viewed in relation to great political changes, to the revival of literature and, above all, to the Reformation. He succeeded in putting an end to the disputes between Louis XII. and the court of Rome; he continued and brought to a close the Council of the Lateran; and, at a conference held at Bologna, concluded a concordat with Francis I. of France. In 1517 he created the unexampled number of 31 cardinals, among whom were Cajetan, Campeggio, Trivulzio, and other learned and eminent men. He planned a great war against the Turks, and resolved about the same time to complete the church of St. Peter at Rome, and in order to raise funds for these schemes he granted to all the faithful, who should contribute by their alms, certain indulgences, the preaching of which in Saxony was one of the forces which resulted in the Reformation. Leo published his first bull against Luther in June 1520, and Luther appealed to a general council and publicly burned the bull at Wittenberg. A second bull appeared against Luther in January 1521, and the papal anathema was echoed by the doctors of the Sorbonne. At the same period war was resumed between the Emperor Charles V. and Francis I., the Pope allying himself first with Francis and soon after with Charles. As an intelligent patron of literature and the fine arts, he was surrounded with many of the most distinguished men of his time. He stimulated the study of Greek and the collection of ancient manuscripts; restored the Roman University and the great Laurentian Library of Florence. Consult: Roscoe, ‘Life and Pontificate of Leo X.’ (1805); Creighton, ‘History of the Papacy During the Period of the Reformation,’ Vols. III.-V. (1882-94); Niti, ‘Leone X. e la sua politica’ (1892); Conforti, ‘Leo X. ed il suo secolo’ (1896).

Leo XI. (Allessandro Ottaviano de' Medici, äl-lĕs-sän'drō ŏt-tā-vē ä'nō dā mā'dē-chē): b. Florence 1535; d. 21 April 1605. He was consecrated Bishop of Pistoria 1573, became Archbishop of Florence in 1574 and entered the college of cardinals. On 1 April 1605 he became pope. He survived only 26 days after his election.

Leo XII. (Annibale della Genga, än-nē-bä'lā dĕl'lä jĕn'gä): b. near Spoleto 1535; d. 10 Feb. 1829. He entered the priesthood in 1783, was made titular archbishop of Tyre ten years later and became a cardinal in 1816. In 1823 he succeeded Pius VII. He was a strong opponent of secret societies, such as the Freemasons and the Carbonari. Consult Artand de Montor, ‘Histoire du Pape Leon XII.’ (1843).

Leo XIII. The death of Leo XIII., on 20 July 1903, excited the most intense interest throughout the world. The Pope had been ill for many days, and each detail of his sickness had been minutely described and cabled by Roman correspondents to all parts of the civilized world. This, in ordinary cases, might have lessened a sympathy, which, as time went on and the august patient lingered, had become almost strained; but in his, it did not. Irrespective of creed, men's reverence followed the Pontiff to the very tomb, and no discordant voice was heard to break the chorus of esteem for one whose moral force had made sectarian bitterness ashamed of itself.

The death of Leo XIII., philosopher, poet, statesman and priest, has shown that theological hatreds are on the decline.

In Carpineto, on 2 March 1810, Joachim Vincent Raphael Lodovico Pecci was born. His father was Count Domenico Lodovico Pecci, then — 1810 — in his forty-first year and his mother Anna Prosperi-Buzi, then in her thirty-seventh. The palace in which Joachim was born was the country house of the family, high in the mountains,— a nest for an eagle. Count Lodovico Pecci confided his sons, Joseph and Joachim (or Vincent) to the Jesuits of Viterbo, who very recently had been restored by Pius VII. to the privileges of which Clement XIV. had deprived them. In 1818, Joachim Pecci began his education in the Jesuit college of Viterbo. He was a fragile boy,— this boy who was to become Pope at 68 and whom death found it hard to conquer at 93 — and he knew nothing of the happy robustness of other boys, in spite of his frequent vacations in his native hills. That devotion to the Greek and Latin classics which later gave him fame as a poet, showed itself early. At the age of twelve he was skilled in writing Latin verse. There still exists an epigram for the provincial of the Jesuits,—

Oh, utinam possem Peccius ipse sequi.

In 1824, Leo XII. carried further the plans of Pius VII. and re-opened the Roman College of the Society of Jesus. This college is likewise known as the Gregorian University. Young Pecci entered and applied himself to his studies with so much earnestness that his health gave way, and, in 1830, though he received the highest honor — that of being chosen for a public disputation in philosophy on theses taken from the whole course,— the Prefect of Studies was obliged reluctantly to excuse him. Still he strove for that perfect health which was denied him. He was a mighty hunter and his gun,— very old-fashioned, with a barrel decorated in the Arabian manner,— is still preserved, and he walked great distances.

In 1832, Joachim Pecci took the degree of doctor, with all possible honors, chiefly recorded in the annals of the Sapienza University. In the College of Noble Ecclesiastics he studied Canon and Civil Law. In 1837, Gregory XVI. named him domestic prelate, and he became known as Monsignor Pecci. On the last day of the year 1837, he was ordained priest by Cardinal Odescalchi, the Vicar General of Gregory XVI. One of the most important epochs in the history of Mgr. Pecci is his administration of the Duchy of Benevento. It was the haunt of smugglers and brigands, licensed by public opinion and supported by noble families. It had given Gregory XVI., who was a lover of justice and order, profound anxiety. At the age of twenty-eight Mgr. Pecci was made Delegate and sent to do what the Neapolitan neighbors of Benevento sneeringly said was «impossible.» Mgr. de Z'Saeclaes well says that his government of Benevento is «a little epic.» He was then called to Spoleto. From thence he went to Perugia, where he busied himself in perfecting measures for the economic and educational progress of the place. The capital of Umbria still reveres him as its benefactor, and his records at Benevento and Perugia,— one destructive of evil, the other constructive of good,— indicated what his future was to be. Early in January 1843, he was chosen for a difficult diplomatic post, the Nunciature at Brussels, and on 19 February he was consecrated Archbishop of Damietta. In Belgium the educational question was burning, and in March 1843, when Archbishop Pecci presented himself to the Court of Brussels, the veteran diplomats smiled at the prospect of a struggle between the Papal Nuncio and that Leopold of Saxe-Coburg, who held the winning cards. The Queen's sympathies were with the Nuncio: she believed in religious education, but the feeling against the «Ultramontanes» ran high; notwithstanding, the Nuncio succeeded in gaining the good-will of all classes and gradually overcoming rancour. This made it all the more astonishing that he should have been recalled from Brussels in 1845. In 1846, he visited London and Paris. He was destined to be Bishop of Perugia; Gregory XVI. died shortly after his arrival in Rome. Pius VIII., the predecessor of Gregory, was followed by another Pius,— Cardinal Mastai Ferretti — who appreciated the value of Pecci so greatly that he felt that as Archbishop of Perugia the late

Nuncio to Brussels could be of more service in healing internal discord than in placating foreign kings and cabinets. He was really, in 1846, only Bishop of Perugia, but as he had been the Titular Archbishop of Damietta, he retained the higher title. He was preconized, — solemnly proclaimed in conclave,— the Bishop of Perugia, on 19 Jan. 1846, and on 26 July he made his solemn entry into the capital of the country of St. Francis d'Assisi. From 1846 to 1878, he ruled in Perugia. He was, in the language of the Psalmist, both a ruler and a shepherd. In the Consistory of 18 Dec. 1853, he was created Cardinal. During his long episcopate, he found the world in miniature in Perugia. The growing antagonism against the church haunted him. He was all for the things of the spirit,— the things of the mind, postulating the truth of the divinity of Christ and the reality of his birth, death and resurrection. In this line, he refutes the claims of Renan, in his ‘Life of Jesus,’ as eagerly as he refutes false Socialism later, in a Papal Letter.

On 7 Feb. 1878 Pius IX. died. On Monday, 18 February, the Cardinals met in conclave. Pecci, as Cardinal Camerlengo, walked last in the procession. On Wednesday, 20 February, by a vote of forty-five out of sixty-one, Cardinal Pecci became Pope. From 20 Feb. 1878 to 20 July 1903, Leo XIII. was constantly active. He restored the Catholic hierarchy to Scotland, early in 1878, and issued his first Encyclical, *Inscrutabile,* against the forces at work for the disintegration of society — putting strong accent on the disregard of the sacramental character of marriage.

In 1878–9 Leo XIII. was in a most difficult position with the Government of Germany. This later year marks the beginning of the decay of the Kulturkampf which strengthened the Centre party in Germany and which made the name of Bismarck detested by German Catholics at home and abroad. In 1879 came the Encyclical, *Quot Apostolici,* followed by the *Æterni Patris* — all encyclicals taking their names from the opening words. The first was aimed at that Socialism «which attacks all that has been wisely decreed by human and divine laws for the protection and ornament of life»; the second is an exposition of the claims of St. Thomas Aquinas as a philosopher.

Another important encyclical,— it is not possible to name them all,— appeared on 12 Feb. 1880. It was the *Arcanum,* on Christian marriage. Another, 29 June 1881, was the encyclical *Diuturnum* in favor of rightful authority. «The Church,» he said, «was everywhere the friend of honest liberty; she detested tyranny.» In 1882 he strove to keep the Irish movement within legal bounds. The encyclical *Etsi Nos,* of February 1882, gave rise to the rumor that he would leave Rome, so «intolerable» had the situation become. In 1890, the world gradually learned that for six years every historical document in the Vatican had been at the service of scholars. He omitted nothing that could add to the progress of historical science. The encyclical, *Humanus Genus,* was aimed at Freemasonry, which assumes an atheistical and anti-religious aspect in Latin countries.

Leo XIII. was aroused to intense enthusiasm for the work of Cardinal Lavigerie in breaking down the slave-trade in Africa, and his encyclical, *In Plurimis,* 5 May 1888, is evidence of his detestation of slavery. It is addressed to the bishops of Brazil. The prudence with which Leo XIII. handled the question of the Knights of Labor was due to the tact he possessed of discovering the best advisers. There were forces at work urging the condemnation of this society; but, owing to the sanity and energy of Cardinal Gibbons, Cardinal Manning and Mgr. O'Connell, now rector of the Catholic University (1903), a disaster by which suspicion and dislike to the Church might have been excited was avoided.

The relations between the late Pope and the United States of America were very close. He appreciated the messages of President Cleveland; and he frequently expressed himslf touched by the respect with which President Roosevelt, representing the American people, treated him. He established the Catholic University at Washington, and constantly expressed interest in it. Leo's interest in the Columbian Exposition at Chicago surprised Europe. His solicitude for the Church in America was profoundly shown in the Apostolical letter, *Testem Benevolentiæ,* on «Americanism,» in which he paternally determines and settles a point for some time in controversy among American Catholics. In the beginning of the year 1893, Mgr. Satolli, afterward Cardinal, became the first Apostolic Delegate to the United States. This is not a diplomatic but a purely ecclesiastical office. Cardinal Satolli was succeeded by Mgr., now Cardinal, Martinelli, and (1903) by Mgr. Falconio, late delegate to Canada.

The efforts of Leo XIII. to direct attention to the study of the Scriptures are historic. Perhaps of all his letters which have a diplomatic character, that written to the French in 1892 caused the greatest discussion. It was received by French Royalists with ill-concealed disgust. There is no question that the pontificate of Leo XIII. was of vital value in the history of the last quarter of a century.

As a poet, Leo XIII. wrote exquisite Latin verse, a translation of which has been made by the Jesuit fathers at Woodstock, Md., and a later and fuller one by Dr. Hugh Henry, of Overbrook Seminary, in Pennsylvania.

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Leo («the lion»), in astronomy, the name given to one of 12 zodiacal constellations. It contains about 100 stars visible to the naked eye, the chief star being Regulus. The sun enters the sign Leo about 21 July. Leo Minor, the Lesser Lion, is a constellation found by Hevelius about 1691. None of its stars reach the fourth magnitude. Leonides are meteors radiating from the vicinity of Leo, usually seen about 14 November.

Leo Minor. See LEO.

Leochares, lē-ŏk'a-rēz, Greek sculptor of the 4th century B.C. He was a pupil of Scopas, and Pliny ascribes to him the sculptures on the west side of the Mausoleum at Halicarnassus. He was one of the artists privileged to make portraits of Alexander the Great. Three statues of Zeus are known to have been executed by him, and his ‘Ganymede carried off by an Eagle’ was famed throughout the ancient world. With Lysippus he produced a colossal bronze group representing Alexander at a lion-hunt. The works of Leochares are all lost, but there is a copy of the Ganymede in the Vatican; and a bust of Alexander may be a copy of one of his.

Leominster, lĕm'ĭn-stėr, Mass., a town of Worcester County, 40 miles west-northwest of Boston, on the Nashua River, and on the New York, N. H. & H., and the Boston & M. R.R.'s. The town is well laid out, has handsome residential sections, six churches, twenty schools, a public library of over 18,000 volumes, and a fine park. Leominster is well lighted with gas and electricity and has a good water supply and abundance of water power, the waterworks being municipalized. It is a busy industrial centre, the home of the comb-manufacture of the State, of piano cases and pianofortes, has large cabinet works, paper mills, tanneries, and extensive manufactures of cement, bricks, yarn, jewelry, toys, buttons, and hairpins. The town is surrounded by some of the most fertile farm land in the county, and horticulture and floriculture are growing industries. Leominster, settled in 1725, was part of Lancaster until 1740 when it received a charter of incorporation. Pop. (1900) 12,392.

Leon, lā-ōn', **Antonio,** Mexican soldier: b. 1794; d. 1847. Having abandoned the side of the royalists for that of the insurgents under Iturbide, he distinguished himself in 1821 by the capture of Tehuantepec, for which he was made lieutenant-colonel. When, however, Iturbide proclaimed himself emperor, the support of Leon was given to Gen. Bravo, the republican leader. In 1824, as deputy from Oajaca, he served in the Constituent Congress, and later he aided in quelling insurrection against the authority of the republic. He was killed at the battle of Molina del Rey in the war with the United States.

Le'on, Iowa, town, county-seat of Decatur County; on the Chicago, B. & Q. and the Keokuk & W. R.R.'s; about 68 miles south of Des Moines, and nearly midway between the Mississippi and the Missouri rivers. It is situated in a fertile agricultural region, and its industries are connected chiefly with farm products and live-stock. It is the trade centre for nearly all of Decatur County. Pop. (1900) 1,905.

Leon, lā-ōn', city in Nicaragua, on a large and fertile plain 13 miles from the Pacific coast. It is laid out on a regular plan, in spacious streets, with intervening squares. The public buildings are considered among the finest in Central America, and include a large and massive cathedral, crowned by a lofty central dome, and flanked by two towers. Other buildings are the old Episcopal palace (built 1678), surrounded by fine gardens; the new Episcopal palace (1873), the churches of La Merced, Recoleccion, and Calvario, remarkable for their size and fine façades, and various other churches; the Tridentine College of St. Ramon, once a flourishing establishment, with professorships of law and medicine, and numerous students, but now possessed only of a nominal existence; the government-house, Cuartel General or head barracks, and the hospital, occupying the old convent of San Juan de Dios. The manufactures of Leon are confined chiefly to articles in dressed leather and cutlery; and the trade, owing to its inland situation, does little more than supply its local wants, but the railway between Leon and Corinto on the coast has somewhat improved it. The markets display fruits and vegetables in great variety and almost boundless profusion. Pop. (1900) 32,000.

León, Philippines, a pueblo of Iloilo, Luzon, situated in the southwestern part of the province near a river, 15 miles northwest of the provincial capital, Iloilo. Pop. 14,000.

Leon, Spain, (1) an ancient northwest province and former kingdom, united to Castile in the 11th century, and now divided into the provinces of Leon, Zamora, and Salamanca; (2) a modern province in the north, with an area of 5,936 square miles and a population (1900) 386,083; (3) a city, the capital of the province, on the Bernesga, 176 miles northwest of Madrid. It is of mediæval appearance, surrounded by dilapidated walls, and has a beautiful park and some fine ecclesiastical structures, including a perfect Gothic cathedral. Pop. (1900) 17,022.

Leon de los Aldamas, dā lōs äl-dä'mäs, Mexico, city in the state of Guanajuato, 32 miles west of the capital of the district. The town is well built and prosperous and is in the centre of a rich agricultural district. It has a public square, cathedral, convents and schools, and has numerous industries including cotton and woolen mills. The town was founded in 1576. Pop. (1900) 48,000.

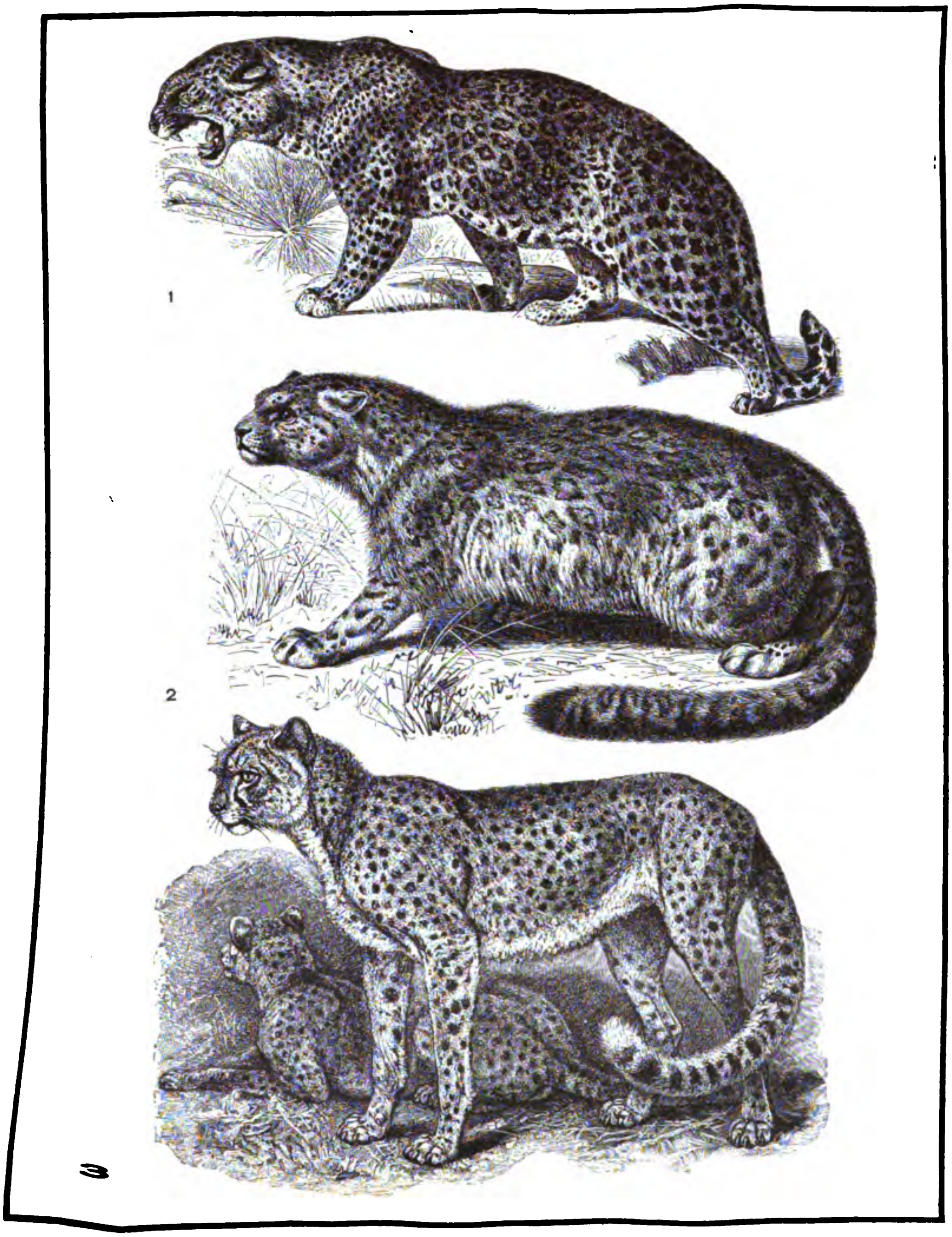
Leon, Ponce de. See Ponce de Leon.

Leonard, lĕn'ẽrd, **Abiel,** American Protestant Episcopal bishop: b. Fayette, Mo., 26 June 1848; d. Salt Lake 23 Dec. 1903. He was graduated at Dartmouth College in 1870, and at the General Theological Seminary, New York city, in 1873. Entering the ministry of the Protestant Episcopal Church, he served in Missouri and Kansas until 1888, when he was consecrated bishop of Salt Lake.

Leonard, Daniel, American jurist: b. Norton, Mass., 29 May 1740; d. London, England, 27 June 1829. He was graduated from Harvard in 1760 and after studying law became a Whig member of the General Court. Disapproving of the extreme measures of the Whigs, his sympathies were with the Loyalists and his papers signed 'Massachusettensis' and published in a Boston newspaper in 1774–5, were replied to by John Adams over the signature 'Novanglus.' Leonard's articles ably defended the position of the English government and they constituted the strongest statement of that position put forth in the colonies. In 1776 he went with the English army to Halifax, N. S., and was among those named in the banishment act of 1778, while his property was confiscated by the act of 1779. He went to England from Halifax and was subsequently for many years chief justice of the supreme court of Bermuda. In 1819 John Adams published the 'Novanglus and Massachusettensis' with a preface. Consult Tyler, 'Literary History of the American Revolution.'

Leonard, James Francis, American telegrapher: b. Kentucky 1804; d. 1862. He was

LEOPARDS.



1. The Leopard or Panther. 2. Snow Leopard or Ounce. 3. Hunting Leopard or Cheetah.

practically the earliest telegrapher to read messages by sound and for his time was the swiftest telegraph operator in the world. In the summer of 1848 he began to receive messages by sound and soon afterward received and wrote out 55 words a minute for Professor Morse, as a test of the invention. He is buried in Frankfort, Ky., where his grave is marked by a monument erected by telegraphers.

Leonard, William Andrew, American Protestant Episcopal bishop: b. Southport, Conn., 15 July 1848. He was educated at Phillips Academy, Andover, Mass., and St. Stephen's College, Annandale, N. Y., and was graduated at the Berkeley Divinity School, Middletown, Conn. In 1873 he was ordained a priest; became assistant at Holy Trinity Church, Brooklyn, N. Y., rector of the Church of the Redeemer there, then rector of Saint John's Church, Washington, D. C., and was chaplain of the 23d regiment of the National Guard of New York and of the Ohio Society in that city. He is now (1904) bishop of Ohio, having been consecrated 12 Oct. 1889. His writings include ‘Via Sacra, or Footprints of Christ’; ‘History of the Christian Church’; ‘New York Church Club Lectures’; ‘A Faithful Life’; ‘Witness of the American Church to Christianity’ (Bedell Lectures, 1894); etc.

Leonardo da Vinci, lā-ō-när'dō dä vēn'chē. See VINCI.

Leoncavallo, Ruggiero, rụd-jä'rō lā-ōn-kä-väl'lō, Italian composer: b. Naples, Italy, 8 March 1858. He was educated at the Naples Conservatory of Music and for many years resided as a teacher in Paris, where he composed songs and fugitive pieces. Under the influence and encouragement of Wagner he wrote his trilogy ‘Crepusculum,’ a drama of Italian history, of which ‘Medici’ is the first part. He is best known by his operas ‘I Pagliacci’ (1892); and ‘La Bohème’ (1897). Other works by him are ‘Tomaso Chatterton’ (1896), a popular opera; and ‘Serafitus-Serafita,’ a symphonic poem.

Leonidas (lē-ŏn'ĭ-dạs) **I.,** king of Sparta: d. 480 B.C. He was a son of King Anaxandrides, and ascended the throne 491 B.C. When Xerxes invaded Greece, the Greek Congress assigned to Leonidas the defense of the pass of Thermopylæ. His force, according to Herodotus, amounted to over 5,000 men, of whom 300 were Spartans. After the Persians had made several vain attempts to force the pass, a Greek named Ephialtes betrayed to them a mountain path, by which Hydarnes led a body of Persians to attack Leonidas in the rear. Before this maneuver could be completed, Leonidas, dismissing all his allies except the Thespians and Thebans, advanced from the pass and threw himself upon the main body of Xerxes' army. He fell early in the action, and a desperate struggle afterward took place over his body, which was rescued by the Greeks.

Leonides, or **Leonids.** See LEO.

Le'onine Verses, a kind of Latin verse, in vogue during the Middle Ages, consisting of hexameters and pentameters of which the final and middle syllables rhyme. They are so called from Leonius, a poet of the 12th century.

Leon'todon. See HAWKBIT.

Leopard, lĕp'ạrd, or **Panther,** one of the great cats widely distributed over Africa and Asia, and prehistorically prevalent in southern Europe. The general color is yellowish fawn, which becomes white on the under aspect of the body, marked with black spots of various sizes, irregularly dispersed; these spots are often rosette-like, but do not enclose a central spot as is the case with its American analogue, the jaguar (q.v.). Black examples often occur. In general appearance and conformation the leopard is tiger-like, but is considerably the inferior of the tiger in size and weight, measuring on the average about three feet and ten inches from the nose to the root of the tail, which is almost as long as the body. This beautiful cat is, however, the peer of the tiger, making up in agility, quickness and wit for its defects in weight and power. Its prey consists of any animal it is able to pounce upon or overcome, and among the native villages and herdsmen of both India and Africa it is dreaded as a destroyer of cattle and sheep, since, like the American puma, when it invades a cattle-pen or sheep-fold it kills many times more animals that it can eat or carry away,— a hundred sheep in a night. Nevertheless, leopards have always been among the partly tamed and trained animals of shows, and they thrive well and breed in captivity.

The leopard — which is more commonly called «panther» in India — frequents mainly wooded and rocky regions, where it can take refuge in trees, or seek among their limbs the birds, monkeys and other arboreal creatures that form a fair share of its food. It does not hesitate to attack large prey, but can rarely overcome a buffalo or one of the larger African antelopes unless the animal is taken at a great disadvantage. Not more than one pair is usually found in a given district; and they make their lair in some rocky jungle, where once a year two to four kittens are born to them, which remain with their mother until they are well grown. One hears less of man-eating leopards than of lions and tigers with the habit of attacking human beings; but the leopard is more widespread, numerous and subtle than either of the others and doubtless is the real perpetrator of many homicides attributed to the larger cats. At any rate the leopard is regarded by those familiar with him as quite as formidable a beast to encounter, and sportsmen adopt the same methods and use the same precautions as when they are pursuing the tiger. A most excellent summary of leopard-hunting experiences may be read in Porter's ‘Wild Beasts’ (New York, 1894). For the leopard in India consult Sanderson, ‘Thirteen Years among Wild Beasts in India’ (1893); Forsyth, ‘Highlands of Central India’ (1889); Hornaday, ‘Two Years in the Jungle,’ and similar writers. The Persian leopard is described at length in Blanford's ‘Zoology of Persia’ (1876); and the African by Baker, ‘Wild Beasts and their Ways’ (1890); Drummond, ‘Large Game and Natural History of South-east Africa’ (1875); and many other sportsmen-travelers in that continent. See CHEETA; SNOW-LEOPARD.

Leopard-cat, a highly variable, tawny, much-spotted cat about two feet long in body, and with a long tail, which dwells in northern

India but is not well known. It is called *Felis bengalensis* by Elliot and also by Mivart, but its identity is doubtful.

Leopard-flower. See Blackberry Lily.

Leopard-frog. See Frog.

Leopard-moth, a large European tussock-moth (*Zeuzera pyrina*), white spotted with black, whose caterpillars bore into the limbs of forest and shade trees, and so weaken them that they die or are easily broken by the wind. This moth has been introduced to America in the neighborhood of New York where it is one of the pests in the parks.

Leopard-shark, a handsomely variegated small shark (*Triakis semifasciatum*), often seen along the coast of southern California.

Leopardi, Giacomo, jä'kō-mō lä-ō-pär'dē, Count, Italian scholar and poet: b. Recanati, in the marshes of Ancona, 29 June 1798; d. Naples 14 June 1837. He devoted himself from an early age to study in the fine library of his father, and when he reached his 15th year was master of Latin and Greek, and had soon read most of the literary masterpieces of antiquity. In 1815 his translation of Porphyry's ‘Life of Plotinus’ was followed by his ‘Saggio sopra gli Errori degli Antichi.’ He was of profound poetic genius and mourned over the degraded political condition of his native land, a feeling which found utterance in his magnificent ‘Ode to Italy’ a poem which proclaimed him the first of modern Italian singers. In 1822 he went to Rome and attracted the attention of Niebuhr by his criticism of a new edition of the ‘Chronicon of Eusebius’; and the great historian attempted in vain to settle him as professor in the University of Berlin. Leopardi was broken in health, as well as in spirit, and his unhappiness was intensified by an unhappy love affair. Bunsen offered him such a professorship and it was declined. He left Rome to travel in Italy, his tour embracing many of the great northern cities, and ending with Naples. He developed the most absolute skepticism, and the unhappiness of his lot made him a pessimist. His sight failed and he was forbidden to take up a book, and though he was a linguist of rare accomplishments, wrote in Greek and Latin with equal ease, had mastered French, Spanish, and English, he could apply his attainments to no practical end. His classic training had, however, given him a power and precision in the use of his native tongue, which was unprecedented in his day. His early lyrics were written between 1816 and 1824, and are distinguished for lucidity, genuine feeling and brilliant command of metre and rhyme. His most famous poem, however, is ‘La Ginestra’ (1836), in which he gives full expression to his hopeless creed, and his poetic productions, some 39 remain to this day the finest and most imperishable utterances of the Italian lyre. His other works include translations, and critical treatises, and after his death were published his prose works, a miscellany of peculiar interest. His ‘Epistolario,’ a collection of his letters, illustrates his personal life. Consult: Autard, ‘Essay sur les Idees philosophiques et l'Inspiration poetique de Giacomo Leopardi’ (1877); Ranieri, ‘Sette Anni di Sodalizio con Giacomo Leopardi’ (1880); Cappalletti, ‘Bibliographia Leopardiana’ (1882); Cesareo, ‘Nuove Ricerche su Giacomo Leopardi’ (1893).

Leopold (lē'ō-pōld) **I.** (George Christian Frederick), **king of the Belgians:** b. Coburg 16 Dec. 1790; d. Laeken 10 Dec. 1865. He was the son of Francis, duke of Saxe-Coburg, and after receiving careful literary and scientific education became a general in the Russian army and was present at the battles of Lützen, Bautzen, and Leipsic. While in England after the peace of 1815 he married Princess Charlotte, heiress of the throne, and was naturalized by act of Parliament in 1816. The princess died in 1817; and Leopold 12 years later married morganatically Caroline Bauer. In February 1830, he was offered the crown of Greece, but declined it. In June 1831, he was elected by a national congress king of the Belgians, and was crowned at Brussels in the following July. He ruled with great prudence, having continual regard to the principles of the Belgian constitution. His daughter, Carlotta, was the wife of Maximilian, emperor of Mexico. Consult Juste, ‘Les Fondateurs de la Monarchie belge, Leopold Ier Roi des Belges’ (1868) an English translation of which appeared, entitled ‘Memoirs of Leopold I.’ (1868); Taillandier, ‘Le roi Leopold et la reine Victoria’ (1878).

Leopold II., Louis Philippe Marie Victor, **king of the Belgians:** b. Brussels 9 April 1835. He is a son of Leopold I. and was married in 1853 to Marie Henriette, Archduchess of Austria (b. 1836; d. 19 Sept. 1902), daughter of Archduke Joseph of Austria. He early manifested an interest in Africa and in 1876 organized at Brussels the African International Association, the aim of which was to utilize African discoveries. He assisted Stanley in the latter's explorations of the Kongo. The Berlin Conference of 1885 established the Kongo Free State and conferred its sovereignty upon King Leopold.

Leopold I., emperor of Germany: b. Vienna 9 June 1640; d. there 5 May 1705. He was the 4th son of the emperor Ferdinand III. of the house of Hapsburg, and of Maria Anna of Spain, and was educated for the church, when the death of his brothers made him heir to the throne of his father. Previous to the death of the latter in 1657, Leopold had been crowned king of Hungary; still mainly in Turkish hands. The war with the Turks having been renewed in 1660, Montecuculi won the battle of St. Gothard on the Raab (1 Aug. 1664), which was followed, however, by a peace which the Hungarian partisans of the emperor regarded as ignominious. In 1678 occurred the great insurrection under Tökölyi, and in 1683 the Turkish invasion of Austria under Kara Mustapha. Leopold fled from Vienna, but John Sobieski's great victory saved his capital and thrones. Buda was retaken after a memorable siege in 1686, and the victories at Zalánkemén (1691) and Zenta (1697) led to the peace of Carlovitz (1699), which also secured the possession of Transylvania. But neither the wholesale executions of Hungarian patriots at Eperies, nor the acquiescence of the diet of Presburg in the proposition to make the male line of the Hapsburgs hereditary in Hungary (1687), could make peace permanent in that long distracted country; and Leopold, who also had to wage three protracted wars against Louis XIV. In the German empire the long reign of Leopold witnessed the growing power of the house of Brandenburg under Frederick William, the great elector, whose son assumed the royal title under the name of Frederick I. in 1701.

Leopold II., emperor of Germany: b. Vienna 5 May 1747; d. there 1 March 1792. He was the 3d son of the emperor Francis I., and succeeded him in 1765 on the throne of Tuscany. The death of his brother Joseph II. in 1790 called him to the greater cares of the vast Austrian dominions and soon after of the German empire. He hastened to make terms with Frederick William II. at Reichenbach (27 July 1790), was unanimously elected German emperor, pacified Hungary by taking the royal oath to observe strictly the constitution and by various concessions, proclaimed a full amnesty and restored all their ancient privileges to the Belgians, gave Tuscany to his son Ferdinand, concluded a peace with Turkey at Sistova (4 Aug. 1791), concerted with Frederick William, Frederick Augustus of Saxony, and others, at Rilnitz, preliminary measures for meeting the aggressions of the French revolution, and finally made a formal defensive and offensive alliance with Prussia (February 1792). Of his 16 children his eldest son Francis succeeded him on the throne.

Lepanto, Battle of, a famous naval engagement fought near the town of Lepanto in Greece, on the Gulf of Corinth, 7 Oct. 1571, between the Ottoman and the combined Mediterranean fleets of the Christian allies, who under the command of Don John of Austria obtained an overwhelming victory. Cervantes (q.v.), the author of ‹Don Quixote,› distinguished himself in this battle, receiving three wounds.

Lepanto-Bontoc, lā-pän'tō-bōn-tōk', Philippines, a province of Luzon formed by the union of the three sub-provinces of Lepanto, Bontoc, and Amburayan, occupying the western central part of northern Luzon; area 1,232 square miles. The province mostly is rugged and mountainous; it is thinly settled and there are no roads, communication being by trails. The only industry of importance is copper mining. Civil government was established in May 1902. Pop. 60,000, mostly Iggorotes and Ifugaos.

Leper. See LEPROSY.

Lepid'olite, or **Lithia Mica**, an important member of the mica group of minerals, as it is now one of the chief sources of the lithia salts so valuable in medicine. Its name, derived from the Greek, lepis, a scale, alludes to its usual occurrence in fine, scaly-granular masses. It rarely occurs in distinct, monoclinic crystals. It has a pearly lustre and a gray, lilac, or peach-blossom pink color. It occurs in small quantities in many parts of Europe and Asia, but by far the most important locality is in San Diego County, California, where it is now extensively mined. It is also found in Maine and Massachusetts and has been mined near Haddam, Connecticut. It is very frequently associated with pink and green gem tourmalines.

Lepidoptera (Gr. λεπίς, scale; πτερόν, wing): An order of the class *Insecta*, comprising the butterflies and moths. The name was given to the order because the wings are covered with little scales, or flattened hairs. The *Lepidoptera* undergo in their development a complete metamorphosis, passing through the stages of the egg, larva, and pupa, before appearing as the perfect insect, or imago.

Eggs.— The eggs of the *Lepidoptera* are minute objects, though generally large enough to be seen with the naked eye. When examined under the microscope they are found to vary greatly in form according to the species. They may be spherical, hemispherical, oval, conic, cylindrical, spindle-shaped, or flattened. The eggs of the *Cochlidiidæ*, or slug-moths, are circular, or elliptical, and greatly flattened, resembling microscopic pancakes. The egg of the common cabbage-butterfly is spindle-shaped. The eggs of both butterflies and moths are generally beautifully fluted with raised lines, or ornamented with a net-work of sculpturings arranged in geometrical patterns. They are always provided with a minute opening in the shell known as the micropyle, permitting them to be fertilized. This is located at the apex in most forms, but in the case of those eggs which are flattened the micropyle is located on the side. The female deposits the eggs upon the plant on which the caterpillars feed, or in close proximity to the food which is to nourish them, in the case of those few species which do not subsist in the larval stage upon vegetable matter.

Larvæ.— When the eggs hatch the insects appear as larvæ, or caterpillars. These undergo successive molts as they increase in size, shedding their skins from time to time until they have attained the development at which the next transformation, known as pupation, occurs. The bodies of larvæ consist normally of thirteen segments, or somites, of which the first is the head. The forms of the larvæ are very various, though in the main they are vermiform and cylindrical. The larvæ of butterflies are for the most part smooth, though in some genera they are curiously ornamented with lateral or dorsal projections, which may be spinous, club-shaped, or filamentous. The larvæ of moths are often hairy, or spinose, and in some genera of the *Lasiocampidæ*, the *Cochlidiidæ*, and the *Saturniidæ*, these spines possess stinging, or poisonous properties. Lepidopterous larvæ possess three pairs of true feet located upon the three segments immediately following the head, and corresponding to the six thoracic feet which are found in the winged form of the insects. In addition to these true feet the bodies of these larvæ are supported by from two to eight pairs of abdominal prolegs, or false feet, which are fleshy and do not recur in the imago. The head is always more or less conspicuous in the larval stage, and is provided with eyes and mouth parts adapted to cutting and deglutition.

One of the most remarkable portions of the anatomy of lepidopterous larvæ are the two long glands located in the dorsal region, which secrete a milky fluid, which is vented through a nipple-shaped organ upon the lower lip known as the spinneret, and which upon exposure to the atmosphere is transformed into the substance known as silk.

Pupæ.— When the larva has attained maturity it is transformed into a pupa. Pupæ may be naked, or they may be enclosed in a structure of silk known as a cocoon. The pupæ of butterflies are usually attached by their anal extremities to twigs, the under side of rails, or stones. The attachment is effected by means of a button of silk into which the hook-like cremaster is thrust. In some families chrysalids are in addition held in place by a girdle of silk. The larvæ of moths usually undergo pupation in a cocoon which may be densely woven or very loosely constructed of a few strands of silk mingled with hairs from the body of the caterpillar, or loose particles of adherent earth or fragments of leaves. Many of the hawk-moths and almost all of the owlet-moths undergo transformation in underground cells which the caterpillars mold for themselves in the soil before changing into pupæ. The duration of the pupal stage varies in length according to the species, or the season. Many species in temperate climates pass the winter in the pupal form. Where there are two or more generations in a season the pupal period is short for the summer broods, and the fall brood hibernates in the pupal state. The pupæ of butterflies are often ornamented with silvery or golden spots, hence the name *chrysalis* has been applied to them, the word being derived from the Greek (*χρυσός*, gold). The pupæ of moths are generally some shade of brown or black. The pupa contains the imago and in almost all cases an examination will show in the pupa the location of the various organs of the perfect insect in a rudimentary form.

The Imago.— When the period of pupation is ended the butterfly or moth breaks through the pupal shell and emerges a four-winged, six-footed insect, known as the *imago*. The females of some species of moths are apterous, or provided with wings so poorly developed that they cannot be used in flight.

Classification.— The classification of the *Lepidoptera* has afforded opportunity for much divergence of opinion among naturalists, but the division into two great suborders, the *Rhopalocera,* or butterflies, and the *Heterocera,* or moths, is well established in usage.

The *Rhopalocera* contains six families:

I. *Nymphalidæ* («Brush-footed Butterflies»).—The front pair of legs greatly reduced in size, tarsi of the male with but one joint, of the female with five, but without claws, the pupa suspended by the cremaster. There are eight subfamilies in this group, more than 250 genera, and about 5,000 species known at the present time. Among these are some of the largest and most splendidly colored butterflies, which are known, as well as some of the smallest and most obscurely colored forms. The family is represented in all parts of the globe.

II. *Erycinidæ* («Metal-marks»).—The female has the first pair of legs weakly, though perfectly developed. The coxa of the foreleg of the males is spined, and the tarsi are unjointed and without claws. There are over 60 genera and fully 1,000 species in this group. The butterflies composing it are generally small, but gaily and curiously colored. The metropolis of the family is found in the hot lands of the New World, though it is also represented in the eastern hemisphere.

III. *Lycænidæ* («Blues,» «Coppers,» and «Hair-streaks»).—The fore legs of the male are aborted, the tarsus having but a single joint terminated by a single claw. There are over 2,000 species known. The butterflies are generally small. The upper sides of the wings are prevalently some shade of blue, bronzy green, or copper, though there are some species, especially in Africa, yellow, red, or white.

IV. *Pieridæ* («Whites,» «Sulphurs,» and «Orange-tips»).— The six legs are well developed in both sexes and the feet have two hooks or claws at the end. There are about 1,200 species known to science. The «cabbage butterfly» and the «common sulphur» of the clover fields are fair representatives.

V. *Papilionidæ* («Swallow-tailed butterflies»).—The six legs are well developed. The claws are simple. About 1,000 species belong to this family, among them some of the largest and most splendid tropical insects.

VI. *Hesperiidæ* («Skippers»).— The six legs are perfect. The claws are short and thick. The bodies are relatively robust. In flight the insects are very quick and powerful, hence the common name. The butterflies are generally small, though there are some quite large species.

There are about 13,000 species of butterflies which have been named and described. It is probable that when we shall have explored the entire earth the total number of existing species may be found to be 18,000.

The *Heterocera,* or moths, may be divided into about 60 families, of which 43 are represented in North America. The families which have the largest number of species in North America are the *Noctuidæ,* or «owlet-moths,» the *Geometridæ,* or «measuring-worm moths,» the *Saturniidæ,* or «wild silk-moths,» the *Arctiidæ,* or «tiger-moths,» the *Sphingidæ,* or «hawk-moths,» the *Tortricidæ,* or «leaf-rollers,» and the *Pyralidæ.* More than 7,000 species of moths are known to occur in the United States and Canada, and probably more than 100,000 species at present exist upon the globe.

The most important of all the *Lepidoptera* from a commercial standpoint is the silk-moth (*Bombyx mori*), which was introduced into Europe from China by way of India, and at an early date was brought to the New World.

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Lep'idosi'ren, the American genus of *Dipnoi* (q.v.) or lung-fishes, closely resembling the African genus *Protopterus,* but having a more eel-like form, smaller scales and the paired limbs reduced to mere filaments of no use in locomotion. The single species *Lepidosiren paradoxa* was discovered by the Austrian naturalist Natterer in the tributaries of the upper Amazon in 1837. For fifty years the species was known from only two or three museum specimens, but in 1887 was re-discovered in abundance in Paraguay by an Italian zoologist, and since then has been the object of several expeditions which have made it well known. It lives in the sluggish, vegetation-choked streams and lakes of that region, the natives of which spear it in large numbers for food. Its large eggs, more than a quarter of an inch in diameter, are deposited in underground nests where they are guarded by the males, whose ventral fins become densely villous and serve as accessory respiratory organs at this time. On the approach of the dry season the muscles of the tail undergo fatty degeneration and the fish retires to a mucus-lined «cocoon» in the mud at the bottom of a burrow sealed at intervals of 3 or 4 inches by plates of mud perforated by two or three small openings. In these retreats the «lolachs,» as they are called by the Indians, remain until the rains again convert the baked earth into mud. The lepidosiren feeds on large aquatic snails, confervæ, and roots.

Lepidos'trobus (Gr. «whirling scale»), a cone from the coal measures, usually found in seams or nodules of clay-ironstone, and often compressed. They consist of a central axis surrounded by imbricated scales or bracts, each containing a sporangium (spore-case). They have been found united to the tip of the branches of *Lepidodendron*, and this shows that they were the fruit of that genus.

Lepidos'teus. See GAR.

Lep'idus, Marcus Æmilius, Roman triumvir: d. Circeii 13 B.C. He became prætor 49 B.C., consul with Julius Cæsar in 46, and in 44 was appointed by Cæsar to the government of Narbonese Gaul and Nearer Spain. He was in Rome at the time of Cæsar's death, and joined Mark Antony. In 43 he united with Antony and Octavianus to form the triumvirate, obtaining Spain and Narbonese Gaul in the division of the empire. After the battle of Philippi (42) a re-division took place, in which Lepidus received Africa, where he remained till 36, when he was summoned by Augustus to assist him against Sextus Pompey. He then tried to seize Sicily, but was overcome by Augustus, who deprived him of his triumvirate, and banished him to Circeii, where he lived under strict surveillance.

Lepor'idæ, a family of rodents comprising the rabbits and hares (q.v.). With the *Lagomyidæ* it constitutes the suborder *Duplicidentata,* distinguished from all other rodents by having two pairs of upper incisors, of which the second is much reduced in size and placed immediately behind the first or larger pair. The hind-legs are much longer than the fore-legs and are well adapted by their structure for the leaping mode of locomotion affected by these animals; the tibia and fibula are completely ankylosed and articulate with the calcaneum by a pulley-like surface, thus combining great strength with great freedom of movement in one plane. The family is now cosmopolitan, but no species is indigenous to Australia. The genus Lepus is practically co-extensive with the family.

Leprosy, a term very vaguely used by medical and other writers to denote a disease, *Lepra tuberculosa,* which appears to have prevailed from the earliest time down to the present. The affection is identical with the *elephantiasis* of the Greeks and the *lepra* of the Arabians, which is altogether different from the *elephantiasis* of the Arabians and the *lepra* of the Greeks. The most prominent symptoms of the disease are as follows: dusky red or livid tubercles of various sizes on the face, ears and extremities; thickened state of the skin with diminution of its sensibility; falling off of the hair, except that of the scalp; hoarse, nasal or lost voice; ozæna; ulcerations of the surface and extreme fetor. The tubercles vary in size from that of a pea to an olive. Hands, feet and face are generally first affected.

In modern times three kinds of leprosy are recognized. In the first variety the whole body becomes white and scaly, without much interference with the general health. This is the true Biblical leprosy, and it is rare nowadays. The second variety makes the victim insensible to pain in the hands and feet in its earlier stages, and later on in the arms and legs. It is known as anæsthetic leprosy. The sufferer from this form of the disease is much troubled with dysentery, and when the disease is advanced his hands and feet are liable to slough off. The third variety of leprosy is known as the tubercular form. It is distinguished by horrible swellings of loose skin, which becomes discolored. This is the commonest modern variety of the disease and the one most repulsive.

In Palestine and the countries immediately east of it leprosy existed until the dispersion of the Jews in the 1st century of the Christian Era. As the power of the Roman Empire declined in the west of Europe a strong tide of emigration from the Levant set in. The plague of leprosy spread with the teaching of Christianity until no country in Europe was free from it. Between the 6th and the 15th centuries leprosy was by far the most dangerous and infectious disease of which any account has come down to us.

To be a leper was to be an outcast beyond hope of any solace but the grave. All the larger towns in Europe had a place specially set apart for its lepers. This reservation was shunned as if it were the mouth of a burning hell. A boundary line was made, beyond which no leper could venture, except at the risk of instant death. If a healthy stranger unwittingly wandered too near the leper's camp he was remorselessly thrust into it and made to share the lot of those previously afflicted. Food was furnished to these leper camps by the town authorities. The provisions intended for the use of the lepers were left on some exposed hill, selected for that purpose, during the daytime, and removed by the inmates of the camp at night. No office, no matter how exalted, served to keep a sufferer from leprosy from universal ostracism.

In the sparsely settled country districts, solitary lepers abounded. Each one wandered about by himself in the unfrequented woods and uninhabited waste places. The rigorous compulsion of the villagers compelled him to wrap himself in a sheet so that only his eyes were exposed. He must carry a bell in his hand and ring it in order to warn wayfarers of his approach. Whenever the dismal tinkling of the leper's bell was heard, the inhabitants fled in terror of their lives. The unfortunate victim supported life as best he might by roots and berries, and by the occasional offerings of charitable persons left where he could find them.

At an early period in the history of the Christian Church efforts were made to alleviate the sufferings of lepers. An order of Saint Lazarus was formed as early as 72 A.D., taking its name from Lazarus, the beggar who ate the crumbs which fell from the rich man's table. Later on, in the 12th century, a military order of Lazarus was founded by the Knights Hospitallers. When these knights were driven out of Palestine they made France and afterward Sicily their headquarters. Numerous lazarettos were established by them in the principal cities of Europe. For many years the grand master of this order was required to be a leper. In civil law the leper was treated as one dead. His property passed to his heirs, his wife was free to marry again, and on his departure for the lazaretto prayers for the dead were repeated over him, and a shovelful of earth was thrown after him to make the ceremony complete.

With the progress of civilization leprosy gradually disappeared from every part of Europe except Norway. Lazarettos gradually fell into disuse, and only the name of leper remained as a by-word to express social and moral contamination. Great Britain was one of the last countries to cut clean of leprosy. As late as the 15th century, 250 leper hospitals were in existence there. The government, as well as other European governments, has practically banished the disease, by careful surveillance. In British America the disease still lingers in New Brunswick. In the hospital for lepers at Tracadie there have been a score of cases regularly for many years.

In the United States leprosy has existed since the Revolution and probably will continue to exist. Leprosy hospitals in secluded spots are maintained in San Francisco, New Orleans, and New York, and cases are always found here in numbers from two or three to a score. In the Philippines at the time of the American occupation there were 15,000 cases in the islands, but by the census of 1902, only about 5,000 cases were reported. The disease was brought to Manila originally from Japan about 200 years ago.

The most celebrated leper colony or settlement in the world is that on the island of Molokai in Hawaii; but the conditions there have been much exaggerated. Molokai lies about 25 miles from the island of Oahu, and about 56 miles from Honolulu. Its native name is Ka-ania-pali, a land of precipices. It is 40 miles long, seven miles broad, and has an area of a little more than 200,000 acres The leper settlement on the elevated, grassy plain of Kalaupapa has an area of 8,000 acres. This plain is bounded on three sides by the ocean, and on the landward side by perpendicular cliffs. There is always a delicious blending of warmth and coolness in the air, which indisposes one for mental and physical effort and soothingly induces a condition of blissful and tranquil repose.

The whole number of lepers at the Molokai settlement in 1902, was officially reported at 1,191, viz.: 741 males and 450 females. There would be, therefore, nearly seven acres of productive soil for every member of the settlement. There are hospitals, dispensaries, churches, and comfortable cottages for the accommodation of families; these cottages are well ventilated, abundantly supplied with fresh water and kept in good condition. Cottage residents requiring medical treatment are attended at their own homes by the resident physician. Every man, woman and child may draw 21 pounds of fresh beef every week, a liberal supply of taro, flour or bread, rice, tea, sugar, salt, tobacco, and matches, and as much good clothing as required. A sum of money is paid to those who do not draw the full ration, which enables them to purchase articles not included in the regular supply.

Whether leprosy can be cured is a question. The administration of tonics and astringents has appeared to give good results. The use of iodides and mercurial preparations have also been tested, as well as the tincture of cantharides; but all of these remedies produce more or less identical effects — that of a temporary amelioration of the condition of the patient, but without well-founded hopes of anything approaching a genuine cure. A well known specialist believes in the use of camphor, in the form of a syrup, as one of the best methods of combating the disease; and his enthusiasm leads him so far as to state that he is convinced that leprosy is curable, if not allowed to pass certain limits, and that even those in the worst stages will derive marked benefits from the camphor treatment. Temporary alleviation has frequently been obtained by various methods, as, in a disease like leprosy, any remedy which tends to improve the state of the blood and the general health will, no doubt, have its temporary ameliorating effect upon the malady itself. Many years of careful study and of patient and conscientious application of all methods of treatment have satisfactorily demonstrated the incurability of the disease, and the most that can be done is to alleviate, as far as possible, the physical suffering and mental distress.

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Lepsius, lĕp'sē-oos, **Karl Richard**, German Egyptologist: b. Naumburg 23 Dec. 1810; d. Berlin 10 July 1884. After studying philology at Leipsic, Göttingen, and Berlin, he published his first work ‹De Tabulis Eugubinis› (1833) and thereupon removed to Paris. In 1835 he visited Italy and took up his residence at Rome. He subsequently went to London and projected with Bunsen a large work on ancient Egypt. He started in 1842 on the first of his two visits to Egypt. His life henceforth was that of an ardent Egyptologist, and honors were showered upon him. He was professor in the Berlin University, director of the Egyptian section of the Royal Museum, director of the Royal Institute, head of the Royal Library, etc. He was author of a large number of important works on Egyptian antiquities.

Leptocar'dii. See ICHTHYOLOGY.

Le'pus («the hare»), in astronomy, one of the 48 constellations south of Orion, containing several bright stars, among them Alpha and Beta Leporis.

Le Queux, lĕ kū, **William,** English novelist: b. London, England, 2 July 1864. He studied art in Paris and was subsequently a journalist there, but presently returned to London and in 1888 was a parliamentary reporter for the '*Globe,*' and its sub-editor 1891–3. In 1900 he was appointed English consul to San Marino. Among his numerous fictions are: 'Guilty Bonds' (1890); 'Sinned Against' (1891); 'The Great War in England' (1892); 'Stolen Souls' (1894); 'Whoso Findeth a Wife' (1897); 'The Day of Temptation' (1897); 'Scribes and Pharisees' (1898); 'Wiles of the Wicked' (1900); 'In White Raiment' (1900); 'The Tickencote Treasure' (1902).

Leray, lĕ-rā', **Francis Xavier,** American Roman Catholic bishop: b. Châteaugiron, France, 1825; d. France 1887. He was educated at Rennes, but in 1843 crossed the Atlantic and settled at Baltimore. He went through the ordinary theological course under the direction of the Sulpicians and was admitted to the priesthood 1852. He was a chaplain in the Confederate service during the war and afterward returned to Vicksburg, and while the plague of 1867 raged, was always at hand to comfort and assist the sufferers. In 1873 he was consecrated to the see of Natchitoches, La., and 10 years later promoted to the archiepiscopal chair of New Orleans.

Lerdo de Tejada, Sebastian, sā-bās'tē-ān lār'dō dā tā-hā'dā, Mexican statesman: b. Jalapa, Mexico, 25 April 1825; d. New York 21 April 1889. He was educated at the College of San Ildefonso, Mexico, was admitted to the bar in 1851 and was appointed a judge of the supreme court in June 1857. He was minister of foreign affairs in 1857; member of Congress in 1861–2 and in 1862–3; and accompanied President Juarez in 1863–7, during which time he was successively minister of justice and minister of foreign affairs. He was elected chief justice of the supreme court in December 1867, and on the death of Juarez, 18 July 1872, succeeded to the presidency, and in the following November was elected to that post. In 1876 he was again candidate to succeed himself, and after a doubtful election was declared re-elected by Congress. This action resulted in a revolution and Lerdo was forced to leave the country. He lived in retirement in New York city till his death.

Lermontoff, lĕr'mŏn-tŏf, **Mikhail Yuryevitch,** Russian poet: b. Moscow 3 Oct. 1814; d. 15 July 1841. He was educated at the University of Moscow, became a hussar of the imperial guard in 1834, and in 1837 wrote his lines 'On the Death of a Poet,' in which he denounced the killing of Pushkin in so vigorous a fashion that he was sent to serve in the army of the Caucasus as an ensign. In 1838 he was pardoned and returned, but later was killed in a duel by one Martynoff, who imagined himself caricatured in Lermontoff's novel, 'A Hero of Our Time.' Lermontoff was a Byronic figure, abounding in ridicule and satire. The Russians rate him as their greatest poet after Pushkin. Had he lived longer he would probably have produced more extended and even more valuable work. His chief poem is 'The Demon,' which has been translated into English by Stephen (1875). 'The Circassian Boy' and 'A Hero of Our Time' also exist in English renderings, the former by Conant (1875), the latter by Pulski (1854) and Nestor-Schurmann (1899).

Lernæ'a. See FISH-LICE.

Le Rossignol, lĕ rŏs'sēn-yōl, **James Edward,** American educator: b. Quebec, Canada, 24 Oct. 1866. He was graduated at McGill College and University, Montreal, in 1888; taught in the public schools of that city 1888–9; from 1889 to 1892 was a graduate student in Germany; in 1892–4 was professor of psychology and ethics in Ohio University; and since then has been professor of economics at the University of Denver. During 1900 he was special lecturer in economics at McGill College and University. He has written much on economical subjects, and has published 'Monopolies, Past and Present' (1901).

Leroux, Charles Marie Guillaume, shärl mä-rē gē-yōm le-roo, French painter: b. Nantes (Loire-Inférieure) 1814; d. 1895. He studied law and entered legal practice; but abandoned the bar for art, and after study with Corot, became a landscape artist. Among his canvases are: 'Souvenir de Fontainebleau'; 'Fête in Haut-Poiton'; 'The Erdre in Winter'; 'Dunes des Chênes Verts.'

Leroux, Frédéric Etienne, frā-dē-rĭk ā-tē-ĕn, French sculptor: b. Ecouché (Orne) 3 Aug. 1836. He studied with Jouffroy and at the Beaux-Arts, became an exhibitor at the Salon in 1863, obtained a medal of the second class at the Paris exposition of 1878, and a silver medal at that of 1889. Among his best known works are: 'Demosthenes on the Shore'; 'Joan of Arc'; 'Marchand de Violettes'; 'Bouquetière.'

Leroux, Hector, French painter: b. Verdun 27 Dec. 1829. He was a pupil of the Beaux-Arts and of Picot, in 1857 obtained by his 'Lazarus' the second Prix de Rome, traveled in Greece and Asia Minor, and became known for his reposeful and dignified scenes from the ancient life of Greece and Rome. Among his works are: 'A New Vestal' (1863); 'Funeral in the Columbarium of the House of the Cæsars' (1864); 'Messalina' (1868); 'The Burial of Themistocles' (1876); 'The Fall of Herculaneum' (1881).

Leroux, Louis Eugène, loo-ē ē-zhān, French painter: b. Paris 28 Sept. 1833. He studied with Picot, became known for his genre-scenes derived from Breton life, and painted, among his more important works: 'Le Nouveau-Né' (in the Luxembourg Gallery); 'Avant l'Ensevellisement'; 'La Prière'; and 'Avant la Confession.'

Leroux, Robert Henri, rō-bār ŏṅ-rē (called HUGUES), French journalist and author: b. Havre 1860. He became a journalist at Paris, where he wrote for the *Temps, Matin, Figaro, Journal,* and other newspapers, and published two works on Russia, 'La Russie Souterraine' (1885), and 'L'Attentat Sloughine,' a story of the Nihilists. He has visited the United States as lecturer before the Cercle Français de l'Harvard. His further works include: ‹L'Autre France› (1900), a drama, with Decourcelle; the works of fiction, ‹Un de Nous› (1886); ‹Le Maitre de l'Heure› (1897); ‹Le Fils à Papa› (1900); and the studies and sketches, ‹Au Sahara› (1891), ‹Portraits de Cire› (1891), ‹En Yacht› (1892), ‹Marins et Soldats› (1892), ‹Notes sur la Norvège› (1894), and ‹Nos Filles: Qu'en Ferons-Nous?› (1898).

Le Row, lĕ rō, **Caroline Bigelow,** American educator: b. New Brighton, Staten Island, N. Y., 28 Dec. 1843. She was graduated at the Boston Normal School, and took courses in physical culture, voice culture and elocution under private instruction. In 1865 she entered the profession of teaching, which she has since followed, her present position (1904) being with the Girls' High School, Brooklyn, N. Y. She has published: ‹Duxberry Doings›; ‹A Fortunate Failure›; ‹How to Teach Reading›; ‹A Practical Reader›; ‹Practical Recitations›; ‹Columbian Speaker›; ‹English as She is Taught› (1902); ‹The Young Idea› (1902).

Leroy, lĕ-roi', **William Edgar,** American naval officer: b. New York 24 March 1818; d. there 10 Dec. 1888. In 1832 he entered the navy as a midshipman and served as a lieutenant on the Princeton during the Mexican War. He served in the United States navy during the Civil War also, doing good service on several important occasions, became a commodore in 1870 and a rear-admiral in 1874. He commanded the South Atlantic squadron 1876–9 and retired from active service in 1884. On account of his courtly manners and general fastidiousness he was often styled «the Chesterfield of the Navy.»

Leroy-Beaulieu, lė-rwä bō-lē-ė, **Henri Jean Baptiste Anatole,** French historical writer: b. Lisieux, Calvados, 1842. He is a brother of Pierre Paul Leroy-Beaulieu (q.v.). In 1881 he was appointed to the chair of modern history in the Ecole Libre des Sciences Politiques, and in 1887 was elected to the Academy of Moral and Political Sciences. He contributed extensively to the ‹Revue des Deux Mondes,› and published in 1887–9 the important work, ‹L'Empire des Tsars et les Russes,› a study of Russian history, politics, and civilization, based partly on direct observation. Others of his publications are: ‹La France, la Russie, et l'Europe› (1888); ‹La Révolution et le Libéralisme› (1890), ‹Israël chez les Nations› (1893).

Leroy-Beaulieu, Pierre Paul, pē-ār pōl, French economist: b. Saumur, Maine-et-Loire, 9 Dec. 1843. He was educated at the Lycée Bonaparte and the Ecole de Droit of Paris and the universities of Bonn and Berlin; became a journalist at Paris; wrote his ‹De l'Etat Moral et Intellectuel des Populations Ouvrières› (1868), crowned by the Academy of Moral and Political Sciences; assisted in founding the Ecole Libre des Sciences Politiques; and was appointed professor of finance there in 1872. In 1880 he became professor of political economy in the Collège de France. He established in 1873 ‹L'Economiste Français,› which he has continued to edit. In 1878 he was elected to the Academy of Moral and Political Sciences. Among his further writings are: ‹Les Guerres Contemporaines› (1853–66; 1868–9); ‹Traité de la Science des Finances› (1877; 5th ed. 1891); and ‹Précis d'Economie Politique› (1888; 3d ed. 1891).

Léry, Jean de, zhŏṅ dė lā-rē, French Calvinist preacher: b. La Margelle, France, 1534; d. 1601. In 1556 he was sent from Geneva to preach at Rio Janeiro, Brazil, where French colonies had been established by the Huguenots, and was the first Protestant minister to preach on the American continent. He and the preachers who accompanied him were obliged to return to France, owing to a bitter misunderstanding which arose between them and those who employed them. Léry has left an account of his travels in the west under the title ‹Histoire d'un Voyage fait en la Terre du Brésil› (1578).

Lesage, Alain René, ā-lăṅ rė-nā lė-säzh, French novelist and playwright: b. Sarzeau, near Vannes, 8 May 1668; d. Boulogne-sur-mer 17 Nov. 1747. He studied law in Paris and became an advocate, but soon afterward turned all his attention to literature. He made many fruitless efforts after recognition and success, principally by translating from the Greek and Spanish. At length two plays of his, ‹Crispin Rival de Son Maître› (1707) (adapted from a Spanish piece of Mendoza's), and ‹Tuscaret› (1708), a satire on the financiers of his day, had a genuine success. But he gained even greater praise and reputation from his comic romance, ‹Le Diable Boiteux› (1707). This was indeed merely an imitation of a Spanish tale of Guevara, which he completely Gallicized so as to direct its point against the pietism which characterized the last period of Louis XIV.'s reign. But his greatest work was ‹Gil Blas de Santillane› (1715). To his eternal disgrace Voltaire as well as many Spaniards jealous for their country's honor asserted that this novel was a bare-faced plagiarism from a Spanish original. In ‹Gil Blas› the wit of the author is triumphant and the surprises and adventures of human life, with all the ups and downs of fortune, are made to rouse our sense of humor as well as our keenest interest, and to dazzle our fancy by the swiftness and variety of their changes. The work is, of course, destitute of high ideal and all moral aim, but it has been compared with those of Rabelais and La Fontaine, and its hero was certainly the precursor of Figaro. The most memorable of Lesage's other romances are ‹Les Aventures de Guzman d'Alfarache› (1732), an imitation of a Spanish romance of Mateo Aleman, and ‹Le Bachelier de Salamanque› (1736), the latter the production of his declining years, and highly valued by him. But his most numerous works were vaudevilles, and comic operas (101 in all). The Academy revenged itself on him for the graceless levity and irreverence toward the learned professions which he exhibited in his works, by refusing to elect him to their number. But they failed to check the growth of his fame His influence was first spread in England through Smollet, and in France through Balzac. A full edition of his works was published in Paris in 1828. Consult: Claretie, ‹Le Roman en France an début du XVIII. Siècle, Lesage Romancier› (1890); Barbaret, ‹Lesage et le Théâtre de la Foire› (1887).

Lesbos, lĕz'bŏs. See Mitylene.

Leschetizky, lĕsh-ĕ-tĭts'kĭ, **Theodore,** Austrian pianist: b. Lemberg, Austria, 1831. He received his musical education in Vienna, and after a successful concert tour in 1864 was made professor of the pianoforte at the conservatory of St. Petersburg, where he turned out many illustrious pupils. In 1878 he returned to Vienna with an ever-increasing reputation. As a pianist he is remarkable for delicacy of touch and a magic power of expression. As a composer he has published some very elaborate pieces for the piano, some songs, and an opera ‹Die erste Falte› (1867). Perhaps the most famous of all his pupils is Paderewski (q.v.).

Lesghians, lĕs'gĭ-ạnz, a Tartar people professing Muradism, a form of Mohammedanism established by a native prophet about 1830. They inhabit the Eastern Caucasus, and form the chief portion of the inhabitants of western Daghestan. They were among the most stubborn of the Caucasian peoples in their resistance to the Russians.

Lesley, lĕs'lĭ, **J. Peter,** American geologist: b. Philadelphia 17 Sept. 1819; d. Milton, Mass., June 1903. He was graduated at the University of Pennsylvania in 1838, for the next three years was engaged as assistant in the first geological survey of Pennsylvania. In 1844 he was graduated at the Princeton Theological Seminary and licensed as a minister. Visiting Europe, he made foot-journeys through several countries, and for a while studied at the University of Halle. From 1845 to 1848 he labored for the American Tract Society among people in the mountain districts of Pennsylvania, and then served two years as minister of a Congregational church at Milton, Mass., resigning on account of a change in his religious views. Returning to Philadelphia, he resumed his geological researches, extending his investigations throughout the coal, oil, and iron regions of this country and Canada. In 1855 he became secretary of the American Iron Association; in 1858 secretary and librarian of the American Philosophical Society; and State geologist of Pennsylvania in 1874. He was also professor of geology at the University of Pennsylvania 1872–8, and there in 1886 was appointed emeritus professor. In 1863 he went to Europe to examine the Bessemer iron-works for the Pennsylvania Railroad Company, and in 1867 was appointed by the United States Senate a commissioner to the Paris Exposition. He edited many works, published numerous scientific papers in various journals and reports, and also wrote: ‹A Manual of Coal and Its Topography› (1856); ‹The Iron Manufacturer's Guide› (1858); ‹Man's Origin and Destiny from the Platform of Sciences›; ‹Historical Sketch of Geological Explorations in Pennsylvania› (1876); and ‹Paul Dreifuss, His Holiday Abroad› (1882).

Lesley, John, Scottish prelate and historian: b. Scotland 29 Sept. 1527; d. near Brussels, Belgium, 31 May 1596. He was educated at King's College, Aberdeen, and in 1554 became professor of canon law there. A firm friend of Mary, Queen of Scots, and by her appointed bishop of Ross, he was concerned in the scheme for her marriage to the Duke of Norfolk, and in the consequent rebellion in the north of England, and was imprisoned in the Tower. While there he wrote ‹Piæ Consolationes.› When released in 1573 he crossed to the Continent, and in 1593 became bishop of Coutances in Normandy. His chief production is a history of Scotland (1578), in 10 books, 7 in Latin and the last 3 Scottish dialect.

Leslie, Charles Robert, English painter: b. London, England, 19 Oct. 1794; d. there 5 May 1859. His parents were Americans, the father being a watchmaker of Philadelphia, and to that city they returned with the boy in 1800. There he attended school, and was afterward apprenticed to a bookseller; in 1811 went to England and studied with Allston, West, and others; was elected associate of the Royal Academy in 1821, and in 1826 to full membership. He first adopted a style in large historical subjects, but his genius led him into historical genre of a humorous character, in which he excelled alike in conception and execution, and in which his gentle humor was as pervasive as his finished manner. He was first brought into wide notice by his ‹Sir Roger de Coverley Going to Church› (1819). To this period belong his portrait of Washington Irving and the illustrations which he designed for that author's ‹Sketch-Book› and his ‹Knickerbocker's History of New York.› Leslie's election as an associate of the Academy was secured by ‹May-day Revels in the Time of Queen Elizabeth.› In 1824 he visited Sir Walter Scott at Abbotsford and painted his portrait. He was elected professor of drawing at the United States Military Academy, West Point, in 1833, accepted the position, but in a few months gave it up and returned to England. In 1838, at Windsor, he painted ‹The Queen Receiving the Sacrament after the Coronation.› From 1848 to 1852 he was professor of painting at the Royal Academy. His principal pictures illustrate scenes from the works of great authors, among his strongest traits delicate perception of character and of womanly beauty being observable. His best known paintings include: ‹Sancho Panza in the Apartments of the Duchess› (1828); ‹Uncle Toby and the Widow Wadman› (1831); ‹The Taming of the Shrew› (1832); and ‹The Dinner at Mr. Page's House› (1838). He published a volume of lectures as a ‹Handbook for Young Painters› (1855); ‹The Memoirs of Constable› (1865); an unfinished ‹Life of Reynolds› (1865); and ‹Autobiographical Recollections› (1860).

Leslie, Eliza, American author: b. Philadelphia 18 Nov. 1787; d. Gloucester, N. J., 1858. Her girlhood was spent partly in London, England, where her brother, Charles Leslie (q.v.), afterward became distinguished as an English artist. She returned to the United States in 1799, and the rest of her life was nearly all passed in her native city. She first became famous by her ‹Seventy-five Receipts for Pastry, etc.› (1827), followed by ‹The Domestic Cookery Book› (1837), 40,000 copies of which were sold; ‹The Home Book› (1840); and ‹The Ladies' Receipt Book› (1846). She had, however, soon after the success of her first work, begun to write juvenile and other works, and for a generation was one of the most popular of American prose writers. Her books are mainly, though not invariably, written to enforce moral instruction, and among them are: ‹The American Girls' Book› (1831); ‹Stories for Helen›;

‘Kitty's Relations’; ‘Leonilla Lynmore’; ‘The Maid of Canal Street’; ‘The Dennings and their Beaux’ (1851); ‘Mrs. Washington Potts’; and ‘The Behavior Book’ (1853). She edited for many years ‘The Gift,’ a popular annual for young women.

Leslie, Frank (assumed name of Henry Carter), American publisher and journalist: b. Ipswich, England, 1821; d. New York 10 Jan. 1880. He was educated at Ipswich; entered a mercantile house at 17; developed artistic abilities, and under the name of Frank Leslie contributed sketches to the ‘Illustrated London News.’ The success of these led to his giving up commercial pursuits to become superintendent of engraving for that paper. In this position he produced valuable inventions, and made himself master of technicalities. Coming to the United States in 1848, he followed his profession here, and in 1854 founded the ‘Gazette of Fashion’ and the ‘New York Journal.’ In 1855 he began the publication of ‘Frank Leslie's Illustrated Newspaper’ (now ‘Leslie's Weekly’), following these with the ‘Chimney Corner,’ the ‘Boys' and Girls' Weekly,’ the ‘Budget of Fun,’ and others. In 1867 he was appointed commissioner to the Paris Exposition, where he received a prize for his services to art. He married Miriam Florence Folline, of Louisiana, and she, having taken at his death, by legislative act, the name of Frank Leslie, successfully continued the business, from which she finally withdrew in 1900.

Les Misérables, lā mē-zā-rā-bl, a novel by Victor Hugo (q.v.), giving a comprehensive view of Parisian life, chiefly among the lower orders, during the 19th century. It was published 3 April 1860, having been translated previously into nine languages. It has been translated since into 12 other languages.

L'Espinasse, Julie Jeanne Eléonore de, zhü-lē zhän ĕl-ā-ō-nōr lā-pĭ-näs, French letter writer: b. Lyons November 1732; d. Paris 22 May 1776. She was an illegitimate daughter of Madame D'Albon, and on the death of her mother she went to live with the Marquise De Vichy, the legitimate daughter of Madame D'Albon, and in 1754 became the companion of Madame Du Deffand (who had already become blind), at the urgent request of the latter. This position she occupied for about 10 years; but the jealousy and selfishness of Madame Du Deffand rendered her situation very uncomfortable. She gained the friendship of all the *élite* of Madame Du Deffand's society, such as Marmontel, D'Alembert, and Turgot; and when the separation between the two ladies at last occurred her friends all adhered to her. Her earliest letters are addressed to a Spanish Marquis, Gonsalvo de More, and the later ones to Count de Guibert, a mediocre poet and essayist. They are infused with passionate devotion and were published by the widow of Guibert in 1800, and appeared in English in Boston in 1903. Consult: Asse, ‘Mlle. de Lespinasse et Mme. du Deffand’ (1877).

Lesquereux, lā-kē-rė, **Leo,** Swiss-American palæontologist: b. Fleurier, Neuchâtel, Switzerland, 18 Nov. 1806; d. Columbus, Ohio, 25 Oct. 1889. He was educated at the Academy of Neuchâtel, at Weimar, and at the University of Berlin; was principal of the College of Chaux-de-Fonds (Switzerland) in 1829-34; made a special study of peat; and was appointed by the Neuchâtel authorities to examine the peat bogs of that canton. In 1844 he received from the Neuchâtel government a gold medal for his treatise, ‘Directions for the Exploration of Peat Bogs.’ In 1848 he came to the United States; was for a short time assistant to Louis Agassiz at Cambridge; and later became assistant to W. S. Sullivant (q.v.), in the study of American bryology, at Columbus, Ohio, where he resided until his death. He made particular investigation of the coal formations of the United States, more especially of the Pennsylvania coal flora, and he became the chief American authority on fossil botany. He published with Sullivant: ‘Musci Americani Exsiccati’ (1856; 2d ed. 1865), and ‘Icones Muscarum’ (1864); and with T. P. James ‘Manual of the Mosses of North America’ (1884). He also contributed (1880-4) three volumes on the coal flora to the Pennsylvania geological survey, which has been considered one of the chief American works on carboniferous plants; and three reports to the volumes published by the Hayden survey. He wrote more than 50 memoirs on scientific subjects. In 1864 he became a member of the National Academy of Sciences, and in 1888 of the Geological Society of London.

Lesseps, lĕs'ĕps (Fr. lė-sĕps), **Ferdinand,** Vicomte de, French diplomat: b. Versailles 19 Nov. 1805; d. 7 Dec. 1894. He entered the diplomatic service in 1828, and after being consul at various places was ambassador to Madrid in 1848-9. In 1854 he went to Egypt at the invitation of the viceroy, Said Pasha; there sketched a plan for canalizing the Isthmus of Suez, and in 1856 published a report on the subject. This great work was at last begun in 1859, and was carried to completion under his supervision in 1869. (See Suez Canal.) He also planned the unfortunate Panama Canal (q.v.), and after the company was dissolved in 1889, judicial proceedings were taken against Lesseps and other directors for maladministration of funds and bribery, and he was condemned to imprisonment. He was elected to the Academy of Sciences in 1875, and to the Académie Française in 1884. Among his writings are: ‘Mémoire à l'Académie des Sciences sur le Nile Blanc et le Soudan’; ‘Principaux Faits de l'Histoire d'Abyssinie’; ‘Lettres, Journal et Documents relatifs a l'Histoire du Canal de Suez’ (1875-81), crowned by the Academy; ‘Souvenirs de Quarante Ans’ (1887); and ‘Origines du Canal de Suez’ (1890). Consult biographies by Bertrand and Ferrier (1887) and by Smith (2d ed. 1895).

Les'sing, Gotthold Ephraim, German dramatist and critic: b. Kamenz, Upper Lusatia, Saxony, 22 Jan. 1729; d. Brunswick 15 Feb. 1781. He was a diligent student, who, according to his tutor, was a horse that needed double fodder. He went to Leipsic ostensibly for a theological training; but he gave his chief attention to general literature, and contributed some interesting articles to literary journals. His academic studies having been concluded at Wittenberg, he went to Berlin, where he was active as journalist and critic, and whither he returned (1758) after a two-years' sojourn at Leipsic. In 1760 he became secretary to General von Tauentzien, governor of Breslau; and in that post continued for more than four years. His independence and fine sincerity led him to reject several opportunities of material advancement; as when he refused the chair of eloquence at Königsberg, because the tenure of it involved an annual eulogy of the king. In 1767 he became critic and director of the theatre at Hamburg which an association of wealthy merchants purposed establishing for the promotion of the national drama. The scheme shortly failed, and from 1770 until his death Lessing was librarian to the Duke of Brunswick at Wolfenbüttel, where he was valued only for the prestige he lent the little state. Lessing was the one who reformed German literature and set it on the way of national growth and progress. He became the foremost German writer of his time, and one of the more remarkable writers of all time, through his ‹Minna von Barnhelm› (1767), the first national drama of Germany, and ‹Laokoön› (1766), the best work of German criticism. ‹Minna von Barnhelm› was an artistic presentation of contemporaneous life, and liberated the German drama from the slavish imitation of the French so exclusively preached by Gottsched. In it Lessing wished to rebuke not only the disposition toward aping the French, but also the indifference of the rulers to the soldiers that had won the Seven Years' war; and to eliminate the provincial hate which then so often existed in Germany, especially that between Prussia and Saxony. In ‹Laokoön› Lessing appears as one of the greatest of critics. His eagerness for truth is remarkable; his revelation of hypocrisies and falsehoods, fearless. His chief argument is that for the establishment of a clear distinction between the plastic arts and poetry, the basic difference being determined to be that while art presents objects in space, poetry presents actions in time. Not all its contentions may be admitted; but Herder, who published a criticism in disagreement with many of its points, yet read it through three times in an afternoon and following evening, and praised it in high terms. Macaulay said it made him wonder and despair; and Goethe, who was greatly indebted to its teachings, declared that by it «all previous criticism was thrown away like an outworn coat.» His ‹Nathan der Weise› (1778; in a good English rendering by E. Frothingham 1868) is the most celebrated of his dramas, and indeed perhaps the most generally familiar of all his writings. It was his ultimate answer to the theological controversialists who had begun their attacks with the publication by Lessing of an edition of portions of a manuscript work, obtained by him while in the ducal library, on the origins of Christianity and written by one Samuel Reimarus. To these ‹Wolfenbüttler Fragmente› (1774–8) Pastor Goeze of Hamburg made the chief objection, and to Goeze Lessing gave his most elaborate rejoinders, such as ‹Eine Parabel,› ‹Axiomata,› and ‹Anti-Goeze.› He does not defend Reimarus, but he does defend free inquiry, and opens up the field for later Biblical criticism and the study of the growth of Christian institutions. Lessing having been directed by the Brunswick government to discontinue the controversy, made a poetic statement of his views in ‹Nathan der Weise,› a remarkable plea for religious tolerance, and a declaration that true religion is one of character, not formula. The work has been criticised from the strictly dramatic viewpoint, but as a dramatic poem has been called one of the finest works of the 18th century. Others of Lessing's works are ‹Emilia Galotti› (1772), a skilful tragedy; ‹Briefe die Neueste Litteratur Betreffend› (1758), with Nicolai, which first directed German thought to the study of Shakespeare; ‹Ueber das Wesen der Fabel› (1760); and the ‹Hamburgische Dramaturgie,› dramatic reviews. «Lessing,» said Goethe, «wished to disclaim for himself the title of poet, but his immortal works testify against himself.» His battle against error in all domains had notable effect in Germany, and has not yet failed of an even wider stimulative interest. A collected edition of his works, prepared by various scholars, appeared in 1868–77. Consult the biographies by Sime (1877) and Zimmern (1878) in English, and by Stahr (1859) and Düntzer (1882) in German. See GERMAN LITERATURE.

Lessing, Karl Friedrich, kärl frēd'rĭh, German painter, grand-nephew of G. E. Lessing (q.v.): b. Wartenberg, Silesia, 15 Feb. 1808; d. Karlsruhe, Baden, 4 June 1880. He was sent about 1822 to the architectural school of Berlin, to fit himself for an architect. After a severe struggle between duty and inclination, he yielded to his artistic inclinations and by the production of his ‹Churchyard with Gravestones and Ruins› (1825) fixed his profession irrevocably. This picture produced a strong impression, and for a year or two the artist devoted himself to landscape; but coming under the influence of Schadow, established himself in Düsseldorf, and studied historical painting with enthusiasm and success. ‹The Court Yard of the Convent — a Snow Scene,› is perhaps the most striking of all his landscapes. ‹The Tyrant Ezzelin in Captivity refusing the Exhortations of the Monks› (1838), was his first important historical picture in the new style. It was followed by ‹Huss before the Council of Constance› (1842), the ‹Seizure of Pope Pascal II.,› the ‹Martyrdom of Huss› (1850), now in New York, and many others, under the influence of which the school of Düsseldorf divested itself of the strictly Catholic spirit by which it was previously characterized, and adopted a bolder and more dramatic manner, and a greater freedom in the choice of subjects. Lessing, however, is distinguished from his associates by depth of thought, energy of expression, and vivid dramatic conception, at the same time that his pictures exhibit the hardness of outline and defective coloring peculiar to the Düsseldorf school. Consult Jordan, ‹Ausstellung der Werke Karl Friedrich Lessings› (1880).

Lesson. See LECTIONARY.

Les'ter, Charles Edwards, American author: b. Griswold, Conn., 15 July 1815; d. Detroit, Mich., 29 Jan. 1890. He studied law in Mississippi, and was admitted to the bar, but afterward spent two years at the Auburn Theological Seminary, and was duly ordained. The pulpit, however, proved not more congenial to his tastes than the bar, and he employed his time chiefly with the pen. He was appointed United States consul at Genoa, 1842–7, and was afterward prominent as a journalist and political speaker. He published ‹Glory and Shame of England› (1841); ‹Condition and Fate of England› (1842); ‹The Artist, Merchant, and

Statesman' (1846); 'Life and Voyages of Americus Vespucius' (1846); 'Artists of America' (1846); 'My Consulship' (1851); 'Our First Hundred Years' (1874-5); and translations of Alfieri's 'Autobiography' (1845); Massimo d'Azeglio's 'Challenge of Barletta' (1845), and Macchiavelli's 'Florentine Histories' (1846).

Lester, John Henry, American inventor: b. Montville, Conn., 27 Sept. 1815; d. Brooklyn, N. Y., 10 Jan. 1900. He was one of the earliest sewing-machine makers in the United States, and besides inventing a lock-stitch sewing-machine, he devised a wood-planing machine, and other labor-saving machines. In 1859-60 he established a wood-planing manufactory in Richmond, Va., and when the Civil War broke out was ordered by the Confederate government to alter arms for its army. Lester, being loyal to the North, withdrew from the firm and went to Washington, D. C., where he had an interview with President Lincoln. Nevertheless, his loyalty was suspected and he was sentenced to ten years' imprisonment by a military commission, but was freed after 20 months' confinement.

Lestocq, lĕs-tŏk, **Jean Hermann,** French physician and adventurer: b. Celle, Hanover, 29 April 1692; d. Livonia 12 June 1767. He was the son of a French Protestant surgeon who had left his native country on the revocation of the edict of Nantes, and when 21 went to Russia to seek his fortune. He was first employed by Peter the Great, but on account of his dissolute morals, was exiled to Kasan in 1718. Catharine I., on her accession in 1725, recalled him, and appointed him physician in the household of her second daughter Elizabeth. He soon gained an influence over the mind of this princess, and when the imperial title devolved upon Ivan VI., he persuaded her that the only way of saving her own life was to seize upon the crown. She yielded to his suggestions, made the young czar prisoner, and seated herself on his throne. Lestocq was then appointed privy councillor, which gave him the rank of general, physician in ordinary to her majesty, and president of the medical college. His prosperity lasted but a few years. Charged with treasonable projects, he was arrested, tortured, and exiled to Siberia. Peter III., on his accession, gave orders for his recall, and Catharine II. gave him an estate in Livonia.

Les'todon, a genus of fossil animals of Patagonia, allied to *Mylodon,* and distinguished by the possession of canine teeth. See Ground-sloth.

Lestrange, lĕs-trānj, Sir **Roger,** English journalist and pamphleteer: b. Hunstanton, Norfolk, 17 Dec. 1616; d. London 11 Dec. 1704. He was probably educated at Cambridge. In 1629 he accompanied Charles I. in his expedition against Scotland. In 1644 he formed a plan for surprising Lynn Regis, but was seized and condemned as a spy. He was, however, respited from time to time until he had been in prison four years, when he escaped to the Continent. In 1653 he returned to England, was licenser of the press from the Restoration until the close of the reign of James II., and edited the 'Public Intelligencer' in 1663, the London 'Gazette' in 1665, and the 'Observator' in 1681, the latter existing till 1687. He was author of a great number of coarse and virulent political pamphlets, and translated Josephus, Cicero's 'Offices,' Seneca's 'Morals,' Quevedo's 'Visions,' and other works of ancient and modern writers.

Lesueur, Eustache, ės-tăsh lė-sü-ėr, French painter: b. Paris 19 Nov. 1617; d. there 30 April 1655. He was taught drawing by his father, a sculptor, and was afterward placed at the school of Vouet, where the Italian masters became his models. His masterpiece is the series of paintings executed for the Carthusian monastery in Paris in 1645-8. These pictures are now in the Louvre, and in twenty-two panels depict the principal scenes in the life of St. Bruno. In 1650 he painted for the corporation of goldsmiths the 'Preaching of the Apostle Paul at Ephesus,' which was presented to the chapter of Notre-Dame, but has been now removed to the Louvre. He did much in decorating the old parish churches of Paris and among his later productions are some mythological scenes in the Hotel Lambert. His works are distinguished by purity of line, careful execution and are conceived in a mood of profound feeling.

Le Sueur, Jean François, zhŏṅ frăṅ-swă, French composer: b. Drucat-Plessiel, near Abbeville, 15 Jan. 1760; d. Paris 6 Oct. 1837. At six he was placed at the musical school of the cathedral of Amiens, and after completing his studies was made director of music in the cathedrals at Séez, Dijon, etc., and in 1784 in the Church of the Innocents, Paris. In 1786 he became master in the Church of Notre Dame. He was afterward induced to compose for the theatre, 'Telemachus,' his first opera, being given with great success in the Théâtre Feydeau. From 1788 he devoted his time altogether to theatrical music. His opera 'La Caverne' was produced in 1793; 'Paul et Virginie' in 1794; 'Télémaque' in 1796; 'Les bardes' in 1804; and 'La Mort d'Adam' in 1809. He was made professor of music in the National Institute. In 1813 he became a member of the fourth class of the Institute; in 1814 composer to the king; and in 1817 professor of composition to the Conservatoire. His sacred music consists of 33 masses, and of oratorios and motets. He also wrote several works on musical subjects.

Letcher, John, American politician: b. Lexington, Va., 29 March 1813; d. there 26 Jan. 1884. He entered the practice of law in 1839, in 1850 was a member of the State constitutional convention of Virginia, and was a member of Congress in the immediate ante-bellum days. In 1859 he was elected to the governorship of Virginia. Though opposed to secession, he yielded to public opinion, and delivered the State troops and munitions to the uses of the Confederacy.

Letch'worth, William Pryor, American writer and philanthropist: b. Brownville, N. Y., 26 May 1823. From 1848 to 1869 he was a manufacturer and merchant in Buffalo, and retired from business to devote himself to benevolent work. In 1873 he became a member of the State Board of Charities, was its vice-president and for ten years its president, resigning from the board in 1896. In 1883 he was president of the National Conference of Charities, and in 1900 president of the first New York State Conference of Charities and Correction. In 1893 the University of New York conferred on him the degree of LL.D. "for distinguished services to the State.» He secured the passage of the New York law for removal of children from almshouses, etc., and has done much for the insane and for other unfortunate classes. He has published: ‘The Insane in Foreign Countries’ (1889); ‘Care and Treatment of Epileptics’ (1900); and papers on social science.

Lethargy, lĕth'ạr-jĭ, an unnatural tendency to sleep, closely connected with languor and debility, and much resembling apoplexy in character. When awakened the person answers, but, ignorant or forgetful of what he said, immediately sinks into the same state of sleep. It may arise from a plethoric habit, from deficient circulation in the brain, or from nervous exhaustion of that organ. A poisoned state of the blood, or a suppression of urine, may induce the lethargic state.

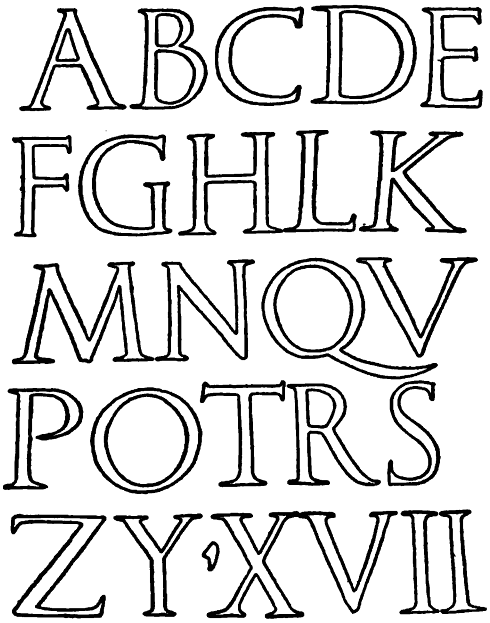
Lethbridge, Canada, a railway and mining town of Alberta, Northwest Territories; on the Belly River and on a branch of the Canadian Pacific railway, 100 miles west of Medicine Hat, 100 miles southeast of Calgary; the northern terminus of the Great Falls & Canada railway, running southward across the international boundary into the United States. It is in a picturesque region formerly given over to ranching, but now as the centre of a vast irrigation system rapidly developing dairying and mixed farming. A good quality of lignite coal is mined here, the seams easily workable estimated to contain more than 350,000,000 tons. The mines give employment to several hundred men, and supply the larger portion of southern Alberta and Assiniboia. It has good schools, churches, banks, and weekly newspapers. Pop. (1901) 2,279; (1904 est.) 2,500.

Lethe, lē'thē (Greek, *Lēthē*, forgetfulness), the mythological River of Oblivion in the lower regions. The water had the power of making those who drank it forget their former existence. Souls before passing into the Elysian fields drank that they might have no recollection of their earthly sorrows; those who were destined to return to the upper world in new bodies, that they might forget the pleasures enjoyed in Elysium.

Letter of Credit. See Credit, Letter of.

Letter of Marque. See Marque, Letter of.

Lettering, the art of designing the letters of the alphabet for various commercial, mechanical, and artistic purposes, largely used in architectural work, sign painting, advertisement designing, engraving, printing and book plate and book-cover making. It may be said that practically all the lettering now used in architectural offices in this country is derived from the old Roman capitals as developed and defined during the period of the Italian Renaissance. Composition in lettering is almost too intangible to define by any rule. All the suggestions that may be given are of necessity laid out on merely mathematical formulæ, and as such are incapable of equaling the result that may be obtained by spacing and producing the effect solely from artistic experience and intuition. The final result should always be judged by its effect upon the eye, which must be trained until it is susceptible to the slightest deviation from the perfect whole. It is more difficult to define what good composition is in lettering than in painting or any other of the more generally accepted arts. The eye must be trained by constant study of good and pleasing forms and proportions, until it appreciates instinctively almost intangible mistakes in spacing and arrangement. This point of «composition» is so important that a legend of most beautiful individual letter forms, badly placed, will not produce as pleasing an effect as an arrangement of more awkward letters when their composition is good.



Classic Roman Alphabet. From Marble Inscriptions in the Roman Forum.

Let'tern. See Lectern.

Letters, papers of correspondence between friends. The first letters of any importance which belong to literature are those of Cicero, in which are described not only his relations with the literary men of his age, his domestic sentiments and the memoranda of his own doings, but also the great political movements of his day. These letters are the most valuable documents extant in relation to the civil war, by which Roman republicanism was abolished and Roman imperialism inaugurated. Nothing can over-estimate their value unless we come to consider the letters of Pliny. The letters of Pliny illustrate the age of Trajan and are principally remarkable as introducing us to the growing power of Christianity in the Roman empire. At the same time they give us the most complete description of the Roman house that is found in Latin literature. The description of the mansion, grounds and garden of the wealthy Romans which this writer gives us is unexampled elsewhere. Passing from the letters of the ancient Romans we come to those of a later age, and we have the letters of Basil, Jerome, and other Christian fathers. Among important relics of literature must be reckoned the letters of those who belong to the great period of the Renaissance. Memorable also are the letters of Erasmus, full of wit and humor, for in them the religiousness of the divine is blended with the genial epigram of the man of letters. The correspondence of great men is always one of those sources of historic information whose importance cannot be overestimated. In looking over the whole field of European literature we find no more illuminating or refreshing fountain of information than in the letters of great men and women. Among these may be mentioned the letters of Madame de Sevigny, the letters of Lord Chesterfield, of Pope, Cowper, those of Gray, Shelley, Keats and Byron, and in our own time those of Fitzgerald. It has been said that the art of letter writing is a lost art, but so long as we have such beautiful and suggestive examples of epistolary correspondence as are contained in the writings of Robert Louis Stevenson and Fitzgerald it is absurd to say that the art of letter writing is one of the forgotten arts.

Letters of Junius. See Junius.

Letters Patent. See Patents.

Letters, Proportionate Use of. Among printers experience has taught the frequency of use of letters, so that the following tables have been compiled:

A	728	N	670
B	120	O	672
C	280	P	168
D	392	Q	50
E	1000	R	528
F	236	S	680
G	168	T	770
H	540	U	296
I	704	V	158
J	55	W	190
K	88	X	46
L	360	Y	184
M	272	Z	22

The following table shows the frequency of use of initial letters:

A	574	N	153
B	463	O	206
C	937	P	804
D	505	Q	58
E	340	R	291
F	388	S	1194
G	266	T	571
H	308	U	228
I	377	V	172
J	69	W	282
K	47	X	4
L	298	Y	23
M	430	Z	18

Lettres de Cachet, lĕt-r-dė-kă-shā, in France, a name given to the warrants of imprisonment issued by the kings before the Revolution. All royal letters (*lettres royaux*) were either *lettres patentes* or *lettres de cachet*. The former were open, signed by the king, and countersigned by a minister, and had the great seal of state appended. Of this kind were all ordinances, grants of privilege, etc. But these checks on arbitrary power did not exist with regard to *lettres de cachet*, also called *lettres closes*, or sealed letters, which were folded up and sealed with the king's little seal (*cachet*), and by which the royal pleasure was made known to individuals or to corporations and the administration of justice was often interfered with. It was not always for political reasons that *lettres de cachet* were obtained; sometimes private persons got troublesome members of their families brought to reason in this way. The lieutenant-general of the police kept forms of *lettres de cachet* ready, in which it was only necessary to insert the name of the individual to be arrested.

Letts, lĕts, a Slavonic people closely akin to the Lithuanians, inhabiting a portion of Russia. Their language, along with the Lithuanian and Old Prussian (extinct), forms the Lettic or Lithuanian branch of the Indo-European family of tongues. The Letts number about 1,000,000.

Lettuce, lĕt'ĭs, a genus (*Lactuca*) of hardy annual and perennial herbs of the order Compositæ. Less than ten of the one hundred recognized species, which are distributed mainly in the northern hemisphere, are in cultivation, and some botanists consider these to be merely forms of three or perhaps two species. They are characterized by opposite leaves of various forms, and white, yellow or blue flowers in heads which are arranged in small panicles. The only species used in America, the common garden lettuce (*L. sativa*) is an annual whose natural prototype is unknown, but is supposed to be *L. scariola*, an Asiatic species.

Lettuce is one of the oldest food-plants, having been used, it is said, by Persian royalty more than 2,000 years ago. To-day it is unquestionably the most widely used of all our salads, and has developed an innumerable host of varieties of great diversity of form. They are somewhat roughly divided into two general groups: heading, in which the leaves form a cabbage-like head; and cutting, in which the leaves are more loosely arranged. In each of these groups are forcing and out-door varieties. A third group, the cos or romaine varieties, which may be considered a subdivision of the cabbage group, consists of long, narrow-headed kinds, whose outer leaves must be tied above the head to properly blanch the inner ones. They are specially valued as summer lettuces, because of their ability to produce leaves of good flavor in spite of considerable heat.

Lettuce succeeds best in cool weather. It requires a rich open soil and clean cultivation; plenty of sunlight in the cool seasons and partial shade in the warm. The seed may be sowed in a hotbed where the plants may be either allowed to develop, or from which they may be transplanted to the garden, eight to twelve inches being allowed between them. Immense quantities of lettuce are forced in greenhouses during the winter, and from the trucking regions of the South, where the plants are grown with only sun heat in canvas-covered beds, the markets are supplied during the winter with thousands of carloads.

When grown under glass lettuce is sometimes attacked by so-called plant diseases — leaf-spot, rust, mildew, and drop or rot. These may be very largely if not wholly controlled by good management, especially with respect to ventilation, the temperature being kept lower than that which is favorable to the growth of the fungi. Sterilizing the soil with live steam at a temperature of about 200° F. for an hour or more is practised and believed by many large growers to destroy the spores. The operation is performed a day or so before planting.

Leucadia, lĕf-kä-dē'ă, or **Leukas.** See Santa Maura and Cape Ducato.

Leucæmia, a disease of unknown origin, characterized by certain changes in the blood, with enlargement of the spleen and lymphatic glands. The disease may come on rapidly, with anæmia and loss of flesh and strength; usually the onset is insidious, the deterioration of the general health or the swelling of the spleen or glands being first noticed. The changes in the blood consist in a decrease of the number of the red cells, diminution of the amount of hæmaglobin in each cell, and great increase in the number of the leucocytes or lymphocytes. The most common form is that showing enlargement of the spleen and glands and peculiar changes in the bone-marrow; next in frequency is the form in which only the spleen and marrow are changed; and the form in which the glands alone are changed (the lymphatic) is considerably less common. Besides the increase in the number of the leucocytes, a form of the cell only found in the bone-marrow appears in the blood. The symptoms are due to the loss of nutrition of the tissues, to the anæmia, to the pressure of the enlarged spleen on the vital structures in the abdomen, and to the pressure of the enlarged glands. The glands most commonly enlarged are the chains along the neck, those in the axilla, the abdominal glands, the glands of the groin, and those of the thorax. They may be barely large enough to be felt or may form bunches in these parts that are plainly visible. Hemorrhages into the skin, eye, or internal organs may occur. The disease progresses for months or years with intervals of considerable improvement. No treatment can cure the disease, but benefit may be obtained from arsenic in large doses.

Leucin (Greek, «white»), a white substance, resembling cholesterin, first discovered by Proust in putrefying cheese, and afterward shown by Braconnot to be formed (together with other products) by the action of sulphuric acid upon animal matters. It is best prepared by the prolonged boiling of horn shavings in sulphuric acid, neutralizing with lime, precipitating excess of lime with oxalic acid, and then evaporating to crystallization. Leucin and tyrosin are thrown down together, but they may be separated by re-dissolving in water, and re-crystallizing, the tyrosin then coming down first. Leucin has the chemical formula $C_6H_{11}O_2.NH_2$, and is known to the chemist as «amido-hexoic acid.» (See AMIDE and HEXOIC ACID.) It may be sublimed, but if it be heated to 338° F. it melts, becoming simultaneously converted into amylamine, carbon dioxid, and ammonia. It is insoluble in ether, but soluble to some extent both in water and in alcohol. Leucin is said to occur in healthy calf's liver, and in certain other healthy tissues, such as the brain of the ox. It ocurs also in certain of the products eliminated by the human skin, but its presence in the urine or in any of the internal organs of man is regarded as indicative of a serious pathological condition. Thus leucin is found in the liver in phosphorus poisoning and in acute yellow atrophy, and also in typhus fever and smallpox. In the healthy body leucin and tyrosin are probably converted into urea, and eliminated as such.

Leucippus, lū-sĭp'ŭs, Greek philosopher, flourished between the 4th and 5th centuries B.C. To him is attributed the first idea of the atomic system afterward perfected by his disciple Democritus. Kepler and Descartes were much indebted to the doctrines of these masters for the explanation of the planetary vortices.

Leucite, a native silicate of aluminum and potassium, having the formula $KAl(SiO_3)_2$, and crystallizing in forms that are isometric at 900° F., but pseudo-isometric at ordinary temperatures. Its anomalous double refraction has been the subject of much study and discussion. The mineral is white or gray in color, and has a hardness of from 5.5 to 6, and a specific gravity of 2.50. It occurs more particularly in recent volcanic rocks, and Vesuvius is the best known locality for it. It is also found in considerable quantity in the Green River basin, Wyoming. Leucite may be converted into the mineral analcite by the action of a soda solution, and the inverse transformation of analcite into leucite is also possible.

Leu'cocytes. See BLOOD.

Leucomaine. See METABOLISM.

Leuthen, loi'tĕn, or **Lissa**, Prussia, a village nine miles west of Breslau, which gives its name to the battle gained here by Frederick the Great, 5 Dec. 1757, over Prince Charles of Lorraine. The Austrians numbered about 90,000, and the Prussians 34,000. The Austrians lost 10,000 in killed and wounded, 12,000 were taken prisoners, besides considerable war munitions, and Silesia was regained. See SEVEN YEARS' WAR.

Leutze, loit'sĕ, **Emanuel**, American artist: b. Gmünd, Würtemberg, 24 May 1816; d. Washington, D. C., 18 July 1868. He was brought to the United States in infancy and early displayed a talent for portrait painting. He studied at Düsseldorf under Lessing and lived abroad for many years after 1841. Among his works, which are largely historical, are: ‹Columbus before the Council of Salamanca›; ‹Columbus in Chains›; ‹Columbus before the Queen›; ‹Landing of the Norsemen in America›; ‹Washington Crossing the Delaware,› perhaps his best known work; ‹Washington at Princeton›; ‹Lafayette in Prison at Olmütz Visited by his Relatives.› In 1860 he was employed by the United States government to make a large mural painting entitled ‹Westward the Star of Empire takes its Way› on one of the staircases in the National Capitol.

Levant, le-vănt' («sunrise,» «orient»), in geology, a term applied by Henry Rogers to the fourth series of the Appalachian Palæozoic strata, called in New York the Medina group, and of equivalent age to the May Hill Sandstone or Upper Llandovery of England. The name is given to signify metaphorically the sunrise period of the Palæozoic day. Its maximum thickness is above 2,000 feet, and most mountains of the Appalachian series are outcroppings of the Levant. There are few organic remains, chiefly marine shells and fucoids.

Geographically the word is a name applied to designate the coast of the Mediterranean immediately east of Italy, including the islands of the Ægean, Egypt, Asia Minor, and Syria.

Levasseur, Pierre Emile, pē-ãr ā-mēl lē-vä-sẽr, French political economist and geographer: b. Paris 8 Dec. 1828. He was educated at the Collège Bourbon and the Ecole Normale, and after holding several important educational posts became in 1876 professor of geography at the Ecole Libre des Sciences in Paris. He has been especially prominent in regard to geographical study in French school and in addition to a series of geographies is author of

‘Public Moneys among the Romans’ (1854); ‘The Gold Question’ (1858); ‘The Laboring Classes of France from Cæsar's Time to the Revolution’ (1859); the same continued to 1867 (2 vols.); ‘The French Population’ (1889-91), an important work; ‘France and her Colonies.’

Levee, lĕ-vē′ or lĕv′ē (from the French word *lever*, to rise, and the time of rising). (1) In social usage, levee is a word used in high life or court language for the ceremonial visits which great personages receive in the morning, as it were at their rising. The levee is distinguished from the drawing-room, inasmuch as at the levee of a gentleman, gentlemen only appear, and at the levee of a lady, only ladies, while at the drawing-room, ladies and gentlemen both are admitted. The meaning is now more extended, and the term is applied chiefly to the stated occasions on which the king or queen of Great Britain publicly receives those subjects whom their rank entitles to the honor. On the first presentation of daughters of dukes, marquises, and earls, it is customary for the queen to kiss them on the cheek. The term is not used in the United States. (2) In hydraulic engineering, an embankment raised on the margin of a river to prevent inundation. That part of Louisiana which lies on the lower Mississippi was subject in a state of nature to the annual overflow of the river, by which immense damage was done to the land. To guard against these inundations, levees of earth have been thrown up for hundreds of miles along the river banks, to a height sometimes of 15 feet, with a breadth of 30 feet at the base. In front of New Orleans the levee is very broad, and serves as a wharf, steamboats and other vessels being moored to it. Breaches sometimes occur in the levees, when the water rushes through and does great mischief; these breaches are called crevasses. See Mississippi Levee System.

Level. (1) In mining, a horizontal gallery or passage. The workings at different depths are said to be at the different levels — the 50 or 60 fathoms level, and so on. A level which opens to the surface at the side of a valley is called a day level, and forms a means of natural drainage without pumping. A drowned or blind level is a drainage gallery which has the form of an inverted siphon. A dip-head level is the one which proceeds from the foot of the engine-shaft right and left, and from which the rooms diverge. (2) In surveying and engineering, an instrument for indicating a horizontal line or determining the position as to horizontality of an object or surface to which it is applied, and then determining the true level, or the difference of rise or fall between two or more places. There are numerous levels, varying in form, size, arrangement, or construction, according to the purpose for which each is intended; as, for instance, the carpenter's, mason's, gunner's, or surveyor's levels, the mercurial, water, and spirit levels, etc. All may be divided into three classes: (a) The simplest, such as the mason's or carpenter's level, in which the vertical line is determined by a plumb line, and the horizontal by a line perpendicular to it. (b) Those in which the horizontal line is determined by the surface of a fluid at rest; as in the water and mercurial levels. (c) Those in which the horizontal line is determined by a bubble of air floating in a fluid contained in a glass tube; as a spirit level.

Lev′elers, the name of an ultra-reform party in Great Britain, which arose in the army of the Long Parliament about the year 1647, and was put down by Fairfax. They aimed at the establishment of an equality in titles and estates throughout the kingdom.

Lev′eling. See Surveying.

Leven, Loch, lŏh lē′vn or lĕv′n, Scotland, a lake in the county of Kinross, of oval shape, four miles long, two miles broad; greatest depth, 90 feet. It contains several islands, on one of which are the remains of the historic castle of Loch Leven, in which Mary Queen of Scots was confined after her separation from Bothwell and where she escaped shortly before the battle of Langside. The trout fishing of the lake is famous.

Lever, lē′vėr, **Charles James**, Irish novelist: b. Dublin 31 Aug. 1806; d. Trieste, Austria, 1 June 1872. He was educated at Trinity College, Dublin, and after studying medicine, partly at Göttingen, he obtained the degree of Bachelor of Medicine from Trinity College in 1831. During the prevalence of cholera in 1832 he gained considerable reputation for his skill and devotion in the treatment of that disease. In March 1834 he contributed his first paper to the new ‘Dublin University Magazine,’ of which he was editor 1842-5. The first chapter of ‘Harry Lorrequer,’ a designation which he afterward made famous as his nom de plume, appeared in the February number for 1837. He removed to Florence in 1847, where he held a diplomatic position, was English consul at Spezzia in 1858 and at Trieste 1867-72. He published: ‘Harry Lorrequer’ (1837); ‘Charles O'Malley’ (1840); ‘Tom Burke of Ours’ (1844); ‘Jack Hinton’; ‘Arthur O'Leary’ (1844); ‘Roland Cashel’ (1850); ‘The Bramleights of Bishops Folly’ (1868); ‘Lord Kilgobbin’ (1872); etc. The rollicking character of the earlier of these was intensely national, and his later novels were more thoughtful and artistic.

Lever, lĕv′ėr or lē′vėr, one of the mechanical powers, a rod or beam of wood or metal by means of which a small force is enabled to balance or overcome a large one. The lever is supported at some point called the *fulcrum*, and it is movable about this point; the resistance to be overcome (called the *weight*), and the force which overcomes it (called the *power*), are applied at other parts of the lever. In order that the power and weight may balance each other, and so produce equilibrium, two conditions must be satisfied. In the first place, they must tend to rotate the lever round the fulcrum in opposite directions, that is, their moments or rotatory effects round the fulcrum must be of opposite sign; and secondly, the product of the number of units of force in the power into the number of units of length in the perpendicular from the fulcrum on its line of action must be equal to the corresponding product for the weight, or, in other words, the moments of the power and the weight about the fulcrum must be of equal magnitude. In the case of a straight lever with parallel forces, to which all other cases of the straight lever may be readily reduced, the equality of the moments may be tested by substituting the distance from the fulcrum along the lever to the point of application of the forces for the perpendicular distance above referred to. Levers are usually divided into three classes. The first includes those in which the fulcrum is between the power and the weight, the second those in which the weight is between the power and the fulcrum, and the third those in which the power is between the weight and the fulcrum.

Leverett, lĕv'ĕr-ĕt, **Frank**, American geologist: b. Denmark, Iowa, 10 March 1859. He was educated at Denmark Academy and the Iowa Agricultural College. In 1886 he entered the United States Geological Survey; was assistant geologist 1890–1900; and since 1901 has been geologist. His special lines of investigation are glacial geology and water resources. He is a member of many scientific societies, and has published: ‘Water Resources of Illinois’ (1896); ‘Water Resources of Indiana and Ohio’ (1897); ‘The Illinois Glacial Lobe’ (1899); ‘Glacial Deposits of the Erie and Ohio Basins’ (1901); and various reports.

Leverett, Sir **John**, American colonial governor: b. England 1616; d. Boston, Mass., 16 March 1679. At 17 he emigrated to America with his father, and settled in Boston. He returned to England in 1644 to take part in the struggle between the parliament and the king, and as commander of a company of foot soldiers gained military distinction and the friendship of Cromwell. He subsequently resided some years at the court of the Protector, as agent of Massachusetts. On his return to America he held successively some of the most important civil and military offices in the gift of the colony, and finally in 1673 was elected governor. His administration is important in colonial history as the era of the war with King Philip, which his skill and energy were instrumental in conducting to a fortunate issue. Two years previous to his death he was knighted by Charles II. in acknowledgment of his services to the New England colonies during this contest.

Leverett, John, grandson of Sir John Leverett (q.v.): b. Boston 25 Aug. 1662; d. Cambridge 3 May 1724. He was an eminent lawyer and judge, speaker of the colonial legislature, and president of Harvard College from January 1707 until his death. He was a man of unusual attainments, and received the honor, then rarely bestowed upon colonial subjects, of membership in the Royal Society.

Leverrier, Urban Jean Joseph, ür-bäṅ zhŏṅ zhō-zĕf lė-vā-rē-ā, French astronomer: b. Saint-Lô 11 March 1811; d. Paris 23 Sept. 1877. He was educated at the Collège Louis Le Grand and the Ecole Polytechnique, and devoting himself to astronomy, made observations which procured him admission to the Academy of Sciences in 1846. About this time he began investigating the perturbations of Uranus. He made calculations with the view of determining the mass and orbital elements of an unknown planet supposed to cause the disturbances, and was able to assign approximately the region where it might be looked for. John Couch Adams (q.v.), then a student at Cambridge, had been making investigations in the same track, and the honor of discovering Neptune (q.v.) is regarded as belonging equally to both. In 1854 Leverrier succeeded Arago as director of the Observatory of Paris, in which post, except an interval from 1870 to 1873, he remained until the end of his life.

Levi, lē'vī, one of the twelve patriarchs, a son of Jacob and Leah. The prince of the Shechemites having wronged his sister Dinah, he, with his brother Simeon, attacked their city and murdered all the males. Jacob reproaches them on his death-bed for this act of cruelty and foretells the dispersion of their descendants: «I will divide them in Jacob, and scatter them in Israel» (Gen. xlix. 7). Three sons went down with Levi to Egypt — Gershon, Kohath, and Merari (Gen. xlvi. 2). Moses and Aaron were of this tribe. See Levites.

Levi'athan (Hebrew) is compounded of two words meaning a *great fish* and *fastened*; hence it probably means a huge fish covered with close scales. The Septuagint renders it *drakōn* (a dragon), and *kētos* (a whale). From the description of it given in the book of Job (xli.) it is usually, and probably correctly, considered to mean the crocodile, though in some places it has been interpreted the whale. See Tristram's ‘Natural History of the Bible.’

Leviathan, The, a treatise on psychology, ethics and politics, by Thomas Hobbes, published in English in 1651, and in Latin in 1668.

Lev'in, Lewis Charles, American politician: b. Charleston, S. C., 10 Nov. 1808; d. Philadelphia 14 March 1860. Removing to Woodville, Miss., he became a school teacher and subsequently followed the practice of law in various States, settling permanently in Philadelphia in 1838. The temperance cause attracted him and he edited a temperance organ. Becoming known as speaker and writer, he formed the Native-American Party in 1843 and published *The Sun*, a daily paper, in its interests. As a representative of the party he was sent to Congress and served three terms (1845–51).

Lev'irate Marriage, among the Jews, the custom of a man's marrying the widow of a brother who died without issue. The same custom or law prevails in some parts of India.

Lévis, François Gaston, fräṅ-swä gäs-tôṅ lā-vē, Duc de, French soldier in America: b. Château d'Anjac, Languedoc, 23 Aug. 1720; d. Languedoc 1787. He served in the French army in various campaigns, and in 1756 was ordered to Canada, where he became second in command to General Montcalm. For his services at the defense of Carillon in 1758 he was promoted major-general; and at Montmorenci in 1759 he repulsed the English under Wolfe. After Montcalm's death on the Plains of Abraham, Lévis took command of the French army, and during the winter of 1759–60 he maintained a vigorous struggle against great odds. He was victor at Sainte Foye in 1760, and might have gained Quebec if the French vessels had arrived at the opening of navigation in that spring. Lévis returned to France, where he continued in the service; he was made a marshal in 1783.

Levis, lā'vē or lĕv'ĭs, **Levis Town** or **Port Levi**, lē'vī, Canada, the chief town of Levis County, Quebec; on the Saint Lawrence River, opposite Quebec city, with which it has ferry communication. It is an important port with government docks; is the landing place for transatlantic travelers; and has a large export trade. Most of the square timber brought down the Saint Lawrence in rafts is here loaded into sailing ships for Europe. It is on the Intercolonial railway, and a terminus of the Quebec Central and of branches of the Grand Trunk railways. It is fortified, has a convent, a board of trade, factories, stores, and lumber-mills. Pop. 7,783.

Levites, lē'vīts, those of the tribe of Levi who were not priests. They were the ministers specially singled out for the service of the sanctuary, and, with the priests, formed the sacerdotal tribe. After the idolatry of the golden calf the Levites were the first to rally round Moses, and then the idea of a special consecration of «an Israel within an Israel» developed itself, and the Levites thenceforth occupied a distinct position. They became guardians of the tabernacle, and no others approached it under penalty of death. From the first the Kohathites, as nearest of kin to the priests, had the highest offices assigned them. They bore the vessels of the sanctuary and the ark itself. A permanent arrangement was made for their maintenance. They were to receive the tithes of the produce of the land, and in their turn to offer a tithe to the priests. When the tabernacle should have a permanent place, the whole tribe was to be assigned 48 cities, 6 of which were to be cities of refuge. The Levites were moreover to preserve, transcribe, and interpret the law, and to read it every seventh year at the Feast of Tabernacles. They were not included in the general census of the people, but in a separate census (I. Chron. xxiii. 3); their number is given at 38,000. Their position was much changed by the revolt of the ten tribes, and after the captivity, in the movement under Ezra, not more than 38 could be brought together. The purity of their blood was stringently guarded both by Ezra and Nehemiah. After the destruction of the temple in the dispersion, they disappeared from history, being merged in the crowd of captives scattered over the Roman world.

Levit'icus, the third book of the Pentateuch, or five books of Moses. By the later Jews it was called the ‹Law of the Priests,› and sometimes the ‹Law of Offerings.› It consists of seven sections, but it may be generally described as containing the laws and ordinances relating to Levites, priests and sacrifices. The regulations respecting the sacrifices are classed in three groups, each consisting of 10 directions. After this section comes a historical section, giving particulars of the consecration of Aaron and his sons, his offering for himself and the people, and the episode of Nadab and Abihu. Then follow laws concerning purity and impurity; laws relating to the position of Israel as markedly distinct from the nations around; a section of laws concerning the priests, holidays, festivals, etc.; a section of promises and threats; and a final section or appendix on vows. Some critics regard Leviticus as forming part of the Priestly Code, and assert that it was post-exilic and belongs to the latest portions of the Pentateuch.

Lev'ulose, a sugar isomeric with dextrose (q.v.) and always occurring with it in honey, in many fruits, and in other sacchariferous vegetable organs, but distinguished by turning the plane of polarization to the left. See also SUGAR.

Lévy, Emile, ā-mēl lā-vē, French painter: b. Paris 20 Aug. 1826; d. Paris 4 April 1900. He studied at the Ecole des Beaux Arts and was also a pupil of Picot and De Pujol; he won the Grand Prix de Rome in 1854. In 1878 he was awarded a first class medal for a picture he exhibited in the Salon. He had received the cross of the Legion of Honor in 1868, and was much valued as a portrait painter. He was also successful in pastel. Among his works are: ‹The Death of Orpheus› (1866), now in the Luxembourg; ‹Supper of the Martyrs› (1859); ‹The Elements› in the Louvre; ‹Presentation of the Virgin› in the Church de la Trinité, etc.

Levy, lē'vĭ, **Louis Edward,** American photo-chemist and inventor: b. at Stenowitz, Bohemia, 12 Oct. 1846. Coming to the United States in boyhood he received his early education at the Detroit public schools. He gave special attention to mathematics and astronomy at the University of Michigan (1866) and to practical optics in Detroit (1861–70). He was connected with the U. S. Lake Survey (1866), made researches in microscopic photography (1867–70) and invented a process in photo-chemical engraving (1875) called the «Levytype.» He received (1896) with his brother Max, a medal for invention of «Levy line screen,» and (1900) a gold medal for Levy «acid blast,» both from Franklin Institute, Philadelphia, and a medal and diploma from the World's Columbian Exposition (1893) for original discoveries. He has published and edited in Philadelphia *The Evening Herald* (1887–90); ‹The Mercury› (1887–91); and has edited ‹The Jewish Year› (1895); ‹The Russian Jewish Refugees in America› (1895); ‹Business, Money, and Credit› (1896). He was elected vice-president of Inventors' Association at Paris in September 1900.

Levy, Uriah Phillips, American naval officer: b. Philadelphia 22 April 1792; d. New York 22 March 1862. Sailing as a cabin boy before his 11th year, he was apprenticed as a sailor in 1804, and before he was 20 had passed through every grade and become master. On 23 Oct. 1812, he was commissioned sailing-master in the navy, serving until June 1813 on the ship Alert and then on the brig Argus. He was placed in command of one of the prizes which the Argus secured, but it was subsequently recaptured and he, with his crew, was imprisoned in England for 16 months. In March 1817, he was appointed lieutenant. Personal antagonism, in which religious prejudice played an important part, subjected him to nearly forty years' struggle, in the course of which he fought a duel, killed his opponent, was court-martialed six times, and finally dropped from the list as captain. He was finally restored to that rank in 1855, and later became commodore.

Levy, lev'ī, (1) a term used in Europe for the compulsory raising of a body of troops from any specified class in the community for purposes of general defense or offense when the existing military forces are insufficient to meet the necessities of the case. When a country is in danger of instant invasion a *levée en masse* is sometimes made — that is, every man capable of bearing arms is required to contribute in person toward the common defense. On less urgent occasions the levy may be restricted to a class, as to men between 18 and 40 years of age. (2) In law, the seizure of property under a writ or other process; usually the taking by a sheriff or marshal of the property of a judgment debtor under an execution. See also ATTACHMENT; EXECUTION.

Lewes, lū'ĕs, **George Henry,** English philosophical writer: b. London 18 April 1817; d. there 30 Nov. 1878. He was in turn clerk, medical student, and student of philosophy in Germany, whence he returned to England in 1840 to devote himself to general literature. His first important work was his ‹Biographical History of Philosophy from Thales to Comte› (1845), of which a second edition appeared, much extended and altered. This work, written largely from a Positivist point of view, sufficiently proved his ability as a thinker and writer. He was literary editor of the ‹Leader› 1849–54, during that time publishing his ‹Life of Robespierre› (1850) and a compendium of Comte's ‹Philosophy of the Sciences› (1853). His ‹Life of Goethe› (1855) won him a European reputation. From 1854 he was largely engaged in physiological investigations with special reference to philosophical problems. To this period belong his ‹Seaside Studies› (1858), ‹Physiology of Common Life› (1860), and ‹Studies in Animal Life› (1862), besides papers on the spinal cord, and on the nervous system, contributed to the British Association. ‹Aristotle, a Chapter from the History of Science› (1864), was his last book before he founded the ‹Fortnightly Review› (1865), from which, a year later, ill health compelled him to retire. His chief work, aiming at the systematic development of his philosophical views, is ‹Problems of Life and Mind› (1873–7). Besides the works already mentioned he wrote ‹The Spanish Drama: Lope de Vega and Calderon› (1846); two novels, ‹Ranthorpe› (1847) and ‹Rose, Blanche, and Violet› (1848); and prepared various plays for the stage under the pseudonym of «Slingsby Laurence.» Few writers have done as uniformly good work in so many fields and over so wide an area. The personal and literary association of Lewes and Mary Ann Evans (see ELIOT, GEORGE), who, for some years, continuing till the death of Lewes, lived together, is believed to have had a strong reciprocal influence on their lives and writings.

Lewes, lū'ĭs, Del., town, in Sussex County; on Delaware Bay and on the Philadelphia, W. & B. railroad; about 40 miles southeast of Dover. The excellent harbor has been improved by an artificial breakwater. It is the shipping point for much of the farm and garden products of the southern part of Delaware. Large quantities of fruit and vegetables are among the products shipped to northern markets. Lewes is the headquarters of the Delaware Bay pilots. Pop. (1900) 2,259.

Lewis, lū'ĭs, **Agnes Smith,** English scholar and palæographist. She was educated at the Irvine Academy, Ayrshire, in her childhood, and subsequently received her tuition from university men of learning. She was married to Rev. S. S. Lewis. Her remarkable services to palæographical science have been recognized by the bestowal upon her of honorary degrees from Halle, Wittenberg, and St. Andrews. In company with her sister, Mrs. Margaret Dunlap Gibson, she visited Sinai four times, and in 1892 discovered and photographed the Syro-Antiochene, or Sinaitic Palimpsest, the most ancient one of the four Gospels known. She has written also: ‹Introduction to the Four Gospels from the Sinaitic Palimpsest›; ‹Some Pages of the Sinaitic Palimpsest Retranscribed›; ‹A Translation of the Syriac Gospels›; ‹The Palestinian Syriac Lectionary of the Gospels›; and other learned works on Scripture antiquities.

Lewis, Alfred Henry, American journalist and author. He was formerly Washington correspondent of the Chicago *Times* (*nom de plume* «Dan Quinn,» and later had charge of the Washington bureau of the New York *Journal*. In 1898 he established in New York ‹The Verdict,› a humorous weekly. He has written: ‹Wolfville›; ‹Episodes of Cowboy Life›; ‹Sandburrs› (1900); ‹Wolfville Days› (1902); Wolfville Nights› (1902); ‹Black Lion Inn› (1903); and ‹Peggy O'Neal› (1903).

Lewis, Alonzo, American poet: once known as the «Lynn bard»; b. Lynn, Mass., 28 Aug. 1794; d. there 21 Jan. 1861. He was the author of ‹Forest Flowers and Sea Shells,› which reached 10 editions, and ‹History of Lynn.›

Lewis, Andrew, American soldier: b. Donegal, Ireland, about 1720; d. Bedford County, Virginia, 26 Sept. 1781. He resided in Augusta County, Virginia, where he was prominent in border conflicts; and in 1754 entered as a volunteer the expedition for taking possession of the Ohio region. Later he became a major in Washington's regiment of Virginians, and was at the surrender of Fort Necessity. In 1756 he was in command of the Sandy Hook expedition; in 1758 participated in that of Major Grant to Fort Duquesne, on which occasion he was taken prisoner and carried to Montreal. He was a commissioner of Virginia in 1768 to arrange a treaty with the Iroquois, in 1774 was appointed a brigadier-general during hostilities with the Indians on the western Virginia border, and 10 Oct. 1774 gained an important victory over the Shawnee confederacy at the battle of Point Pleasant (at the mouth of the Great Kanawha). He was a brigadier-general in the Continental army from 1 March 1776 to 15 April 1777, and then entered the Virginia civil service. He drove Lord Dunmore from Gwynn's Island 9 July 1776. For several years he sat in the Virginia house of burgesses, and in the Virginia conventions of May and June 1775 was a delegate from Botetourt. As a soldier he was highly regarded by Washington. See COLONIAL WARS IN AMERICA.

Lewis, Charles Bertrand («M. QUAD»), American journalist and author; b. in Ohio 1842. He was educated at the Michigan Agricultural College, and served in the Union army during the Civil War. His journalistic work began on the staff of the Detroit *Free Press*, and he soon became known as a descriptive and humorous writer under the name of «M. Quad.» In addition to his work in this field, in connection with various publications, he has also written: ‹Field, Fort and Fleet; A Sketch-Book of the Civil War›; ‹The Lime-Kiln Club›;

‹Sawed-off Sketches›; ‹Mr. and Mrs. Bowser›; ‹Quad's Odds›; and several plays.

Lewis, Charlton Thomas, American lawyer and author: b. West Chester, Pa., 25 Feb. 1834; d. Morristown, N. J., 26 May 1904. He was graduated at Yale in 1853, and after studying with a view to entering the ministry, served as professor at the State Normal University at Bloomington, Ill., 1856–7, and from 1858 to 1861 was professor in Troy University. In 1863–4 he was a United States deputy commissioner of internal revenue. He entered upon the practice of law in New York city in 1865; was associated with William Cullen Bryant in editing the *Evening Post;* and returned to law practice in 1871. At Harvard, Columbia, and Cornell universities, during 1898–9, he was a lecturer on insurance. He was also president of the Prison Association of New York and of the State Charities Aid Association of New Jersey. Among his published works are: ‹Gnomon of the New Testament,› translated from the German of Bengel (1861); ‹History of Germany› (1870); ‹Harper's Latin Dictionary,› in collaboration with Charles Short (1879); ‹Latin Dictionary for Schools› (1889); ‹Elementary Latin Dictionary› (1890); etc.

Lewis, Dio, American physician and author: b. Auburn, N. Y., 3 March 1823; d. Yonkers, N. Y., 21 May 1886. He studied at the Harvard Medical School, and practised for a time at Port Byron and at Buffalo, N. Y., publishing at Buffalo a monthly periodical with hygienic aims. He became widely known by his writing in advocacy of a system of higher gymnastics, and finally established a school in Boston in which teachers were trained in his new exercises; and a school for young ladies was also founded at Lexington, Mass., which was destroyed by fire in 1868. About 1883 he removed to New York. He wrote many articles for magazines, and his more extended works include ‹The New Gymnastics› (1862); ‹Weak Lungs and How to Make them Strong› (1863); ‹Talks About People's Stomachs› (1870); ‹Our Girls› (1871); ‹Chats with Young Women› (1871); ‹Chastity› (1872); ‹Gypsies› (1881); and ‹In a Nutshell› (1883).

Lewis, Edmonia, American sculptor: b. New York 4 July 1845. She was of negro and Indian parentage. With slight instruction in sculpture she developed a talent for that art, and came into notice in 1865 through the exhibition of her first known work, a bust of Colonel Robert Gould Shaw, in Boston. That year she went to Rome to study, and there she soon afterward established permanent residence. Her works include ‹The Freedwoman›; ‹The Death of Cleopatra› (1876); ‹The Marriage of Hiawatha›; ‹The Old Arrow-Maker and his Daughter›; ‹Asleep›; ‹Madonna with the Infant Christ›; and many portrait busts, among them those of Lincoln, Sumner, and John Brown.

Lewis, Estelle Anna Blanche (Robinson), American dramatist: b. near Baltimore, Md., April 1824; d. London 24 Nov. 1880. While a schoolgirl she made a verse-rendering of the ‹Æneid› into English; wrote ‹Forsaken› and published ‹Records of the Heart› (1844). Her best dramatic work, ‹Sappho of Lesbos› (1868), a tragedy, ran through seven editions, was translated into modern Greek, and played at Athens. Edgar A. Poe spoke of her as the rival of Sappho; Lamartine called her the «female Petrarch.» Others of her works are: ‹The Child of the Sea, and Other Poems› (1848); ‹The Myths of the Minstrel› (1852); ‹Poems› (1866); and ‹The King's Stratagem› (1869), a tragedy.

Lewis, Francis, American patriot: b. Llandaff, Wales, March 1713; d. New York 30 Dec. 1802. He entered commerce in London, but later came to America, and established a mercantile business in New York and Philadelphia. He made numerous successful business voyages to Europe, and in 1752 obtained the contract for clothing the British army in America. In the same year he was aide-de-camp to Gen. Hugh Mercer at Oswego, N. Y., when Montcalm advanced against it. After the capitulation, he was sent to France, and subsequently exchanged. For his services the government presented to him 5,000 acres of land. From 1765 he took part in public affairs. He was one of the New York committee in the 1st Colonial Congress (1765), in 1775 was elected to the 1st Continental Congress, in 1776 signed the Declaration of Independence, in 1777 was again elected to Congress, and in 1779 became commissioner of the board of admiralty. He expended his wealth most freely in the patriot cause, to which his commercial knowledge also was very useful.

Lewis, Henry Carvill, American geologist: b. Philadelphia 16 Nov. 1853; d. Manchester, England, 21 July 1888. He was graduated from the University of Pennsylvania in 1873, served as a volunteer in the State Geological Survey of Pennsylvania in 1879–84, was professor of mineralogy in the Academy of Natural Sciences of Philadelphia in 1880–8, and of geology at Haverford College in 1883–8. In 1886–7 he studied at Heidelberg, and in 1887–8 made special investigations regarding the origin of the diamond. He prepared a chart of the various ancient ice-sheets and glaciers of England, Ireland, and Wales, for some time edited the mineralogical department of the ‹American Naturalist,› and wrote extensively on geological subjects, including: ‹The Antiquity of Man in Eastern America, Geologically Considered› (1880). ‹The Geology of Philadelphia› (1883). ‹Comparative Studies upon the Glaciation of North America› (1886), and ‹The Terminal Moraines of the Great Glaciers of England› (1887).

Lewis, James, American actor: b. Troy, N. Y., about 1840; d. West Hampton, Long Island, N. Y., 10 Sept. 1896. He first appeared in 1858 at the Troy Museum as Farmer Gammon in ‹The Writing on the Wall›, played second comedy parts for a time at the Greene street theatre of Albany, was later with a traveling company on the Georgia circuit, and was at Birmingham, Ala., when the Confederacy was proclaimed. Having escaped to the North, he afterward (1866) appeared at the Olympic, New York, as low comedian in ‹Your Life's in Danger›, and from 1869 until his death he was leading comedian in Augustin Daly's company. He took numerous parts with excellent versatility.

Lewis, John Francis, American politician: b. near Port Republic, Rockingham County, Va., 1 March 1818; d. Harrisonburg, Va., 2 Sept. 1895. He was a planter, was a member of the Virginia State convention of 1861, refused to sign the ordinance of secession, and in 1869 was elected lieutenant-governor of the State on the ticket with G. C. Walker. In 1869 he was also elected as a Republican to the United States Senate, where he served from 24 Jan. 1870 to 3 March 1875. He was appointed (1877) by President Hayes United States marshal for the western district of Virginia, but afterward resigned the post.

Lewis, Matthew Gregory, called «Monk» Lewis, English author: b. London 9 July 1775; d. at sea on the way from Jamaica to England 14 May 1818. He was educated at Oxford, in 1794 became a member of the British embassy at The Hague, and in 1795 published ‹Ambrosia, or the Monk› (whence his sobriquet), which had a great success at the time. In 1796–1802 he represented Hindon, Wiltshire, in the Commons. Of his various dramatic works the best-known is ‹The Castle Spectre›, first presented in 1798, and abounding in storms and other melodrama. He visited, in 1815–6 and 1817–8, his property in the West Indies, to provide for the suitable treatment of his negro slaves; and published the ‹Journal of a West Indian Proprietor›, which is interesting as a description of the condition of the negro in Jamaica of that time. His writings had considerable influence on the early poetry of Walter Scott, for whose translation of ‹Götz von Berlichingen› he obtained the publication in 1799.

Lewis, Meriwether, American explorer: b. near Charlottesville, Va., 18 Aug. 1774; d. near Nashville, Tenn., 8 Oct. 1809. He enlisted in the troops called out for suppression of the «Whiskey Rebellion» in western Pennsylvania in 1794, entered the regular service in 1795 as lieutenant of the line, in 1797 was promoted captain, in 1801–3 was private secretary to Jefferson, and in the latter year was appointed commander of an expedition to cross the continent, with Capt. William Clark (q.v.) as second in command. On 5 July 1803 he left Washington for Pittsburg, Pa., where the expedition was equipped; but he did not begin to ascend the Missouri until the ice had broken in the spring of 1804. Then he proceeded up the river to its sources, crossed to the Rocky Mountains, reached the headwaters of the Columbia River, floated down that river to the Pacific, and explored a large part of the Oregon region. He had covered in all more than 4,000 miles from the junction of the Missouri with the Mississippi. Having wintered in an intrenched camp on the south bank of the Columbia, he started eastward 23 March 1806, and arrived at Washington 14 Feb. 1807. He received a grant of land and was appointed governor of Louisiana, where he found much confusion, and where he was successful in restoring order. He was a bold explorer, and familiar with Indian matters. Consult memoir by Biddle and Allen (new ed. 1843), and Lighton, ‹Lewis and Clark› (1901; Riverside biography series). See also Lewis and Clark Expedition.

Lewis, Morgan, American statesman: b. New York 16 Oct. 1754; d. there 7 April 1844. He was graduated from the College of New Jersey in 1773, studied law, in 1774 entered the Continental army, was commissioned major in the 2d New York, later became chief-of-staff to Gates with colonel's rank, and quartermaster-general of the northern army. He commanded at Crown Point; and after the war entered legal practice in New York. Elected to the assembly, he also became judge of the court of common pleas, attorney-general of New York (1791), judge of the supreme court (1792), chief justice of the court (1793), and governor (1804–7). In 1810 he was elected to the State senate, in 1812 became quartermaster-general of the armies of the United States, in 1813 was promoted major-general, and was in command at Sackett's Harbor and French Creek. He was president of the New York Historical Society, and president-general of the Cincinnati.

Lewis, Tayler, American author and educator; b. Northumberland, N. Y., 27 March 1802; d. Schenectady, N. Y., 11 May 1877. He was graduated at Union College in 1820; studied law in Albany, and practised at Fort Miller, but soon gave nearly all his time to the study of classical literature. In 1838 he was appointed professor of Greek at the University of New York, and in 1849 accepted the same professorship at Union College. He attained distinction as a philologist and in Christian apologetics. Besides contributing largely to periodicals, he published the following works: ‹The Nature and Ground of Punishment› (1844); ‹Plato contra Atheos› (1845); ‹The Six Days of Creation› (1855); ‹The Bible and Science› (1856); ‹The Divine Human in the Scriptures› (1860); ‹State Rights, a Photograph from the Ruins of Ancient Greece› (1864); and ‹The People of Africa, Their Character, Condition, and Future Prospects›, with E. W. Blyden and Timothy Dwight (1871). He was a member of the Bible Revision Committee.

Lewis, William Draper, American lawyer: b. Philadelphia 27 April 1867. He was graduated at Haverford College in 1888, and at the University of Pennsylvania in 1891. In the latter year he was instructor in legal historical institutions in the Wharton School, University of Pennsylvania; from 1890 to 1896 was lecturer on economics at Haverford, and has edited the ‹American Law Register.› He has written: ‹Federal Power over Commerce and Its Effect on State Action› (1891); ‹Our Sheep and the Tariff› (1891); and many periodical articles on legal, historical, and economical subjects. Among the works which he has edited are ‹Wharton's Criminal Law› (1895); ‹Lewis' Edition of Greenleaf's Evidence› (1896); ‹Lewis' Edition of Blackstone's Commentaries› (1897); ‹Digest of Decisions and Encyclopedia of Pennsylvania Laws›; etc.

Lewis, or Lewis-with-Harris, Scotland, the largest of the Hebrides, separated from the mainland by the Minch, a sea 30 to 35 miles wide. The northern larger portion, Lewis, is in Ross-shire, and is separated by a narrow neck from the southern portion, Harris, which belongs to Inverness-shire. The island is 52 miles long, varies in breadth from 5 to 30 miles, and has a diversified surface, which attains an elevation of over 2,700 feet. Capital, Stornoway. Pop. of island (1901) 32,160.

Lewis and Clark Expedition, The, in American history, a celebrated expedition to the northwestern part of the United States in 1803, under the command of Captain Meriwether Lewis of Virginia, and Captain William Clark, the results of which gave a more definite idea of our natural resources in this hitherto unexplored region than had ever been known. Recognizing the importance of a thorough and accurate knowledge of the vast extent of country acquired by the United States with their independence, Thomas Jefferson, while minister to France suggested to the traveler, Ledyard, an exploration of western America. Nothing came of it, however. In 1792 he made a similar proposition to the American Philosophical Society (q.v.), and Michaux, the celebrated traveler and botanist, proceeded as far as Kentucky, when he was recalled by the French minister. In January 1803, in a confidential message to the Congress, President Jefferson recommended an appropriation for this purpose. It was granted and he appointed Lewis, who had been his private secretary nearly two years, to the command of the expedition along with Clark. Lewis, while nominally in command of the expedition, always regarded Clark as his official equal, and during the three years of trying experience the two men worked hand in hand toward their great object with increased friendship and respect for each other. Lewis left Washington on 5 July 1803 and was joined by Clark at the Ohio. The expedition was delayed at Pittsburg till 31 August, then proceeded on its way toward the Mississippi, Lewis choosing volunteers from the military posts along the way. The intention had been to winter at La Charette, a French settlement on the Missouri, but owing to the advanced season the first winter camp was pitched at River Dubois, on the Mississippi, about opposite the mouth of the Missouri. On 9 March 1804 Lewis was one of the witnesses to the transfer of Upper Louisiana at St. Louis; on 14 May 1804 he set out from River Dubois on the long journey up the Missouri. The party comprised in addition to Lewis and Clark, three sergeants, twenty-three soldiers, three interpreters, and Clark's negro slave York. Toward the end of October they reached the Mandan country and put up for winter quarters near the site of the present city of Bismarck, N. D., after a troublesome journey of 1,600 miles, battling against the swift current, the snags of the river, and its falling banks. Much of this distance Lewis traveled on foot, hunting, collecting specimens, and making notes upon the country. The journey was resumed 7 April 1805, and on the twenty-sixth the party reached the mouth of the Yellowstone, one or the other of the captains, usually Lewis, pushing ahead with hunters on foot to provide game for the camps and to examine the country. On 3 June they passed and named Maria's River, and on the thirteenth came to Great Falls. Nearly a month was spent in making the portage, and on 25 July the party came to the triple fork of the Missouri. Naming the three branches Jefferson, Madison, and Gallatin, they proceeded up the Jefferson River, and on August 12 reached the head of navigation. Then marching across the Nez Percé trail, along the Bitter Root Mountains, came to the headwaters of the Clearwater branch of the Columbia. On 7 October they launched their canoes for the descent of this great river to the Pacific, which they reached 15 November. A fortified camp, called by the explorers Fort Clatsop, was pitched on the shore of Young's bay, and here with much hardship the winter was spent. The return journey was begun 23 March 1806, and on 8 May the headwaters of the Clear water were reached. On the return journey the party divided and explored a large part of the present state of Montana, uniting again below the mouth of the Yellowstone. Rapidly descending the Missouri they arrived at St. Louis, 23 September 1806. Both Lewis and Clark kept elaborate and valuable journals. Unfortunately they were never to edit them. A paraphrase by Nicholas Biddle, a friend of Jefferson, appeared in 1814, and has run through many editions. Not until 1903 were these priceless papers published in their complete form, presenting the first authentic record of this extraordinary expedition.

Lewisburg, lū'ĭs-bėrg, Pa., borough, county-seat of Union County; on the Susquehanna River, and on the Philadelphia & R. and the Pennsylvania R.R.'s; about 50 miles north of Harrisburg. It is on the border of the great anthracite coal fields, and in a fertile agricultural valley. Its chief manufactures are flour, lumber, furniture, shirts, woolen goods, machine shop products, and acetylene gas. Its trade is chiefly in its manufactured products and in grain and vegetables. It is the seat of Bucknell University, opened in 1846 under the auspices of the Baptists. Pop. (1900) 3,457.

Lewisburg, Battle of. On 21 May 1862 Gen. Heth, with a Confederate force of three regiments of infantry, a battalion of dismounted men, a regiment of cavalry and three batteries, aggregating about 2,200 men, marched from Salt Sulphur Springs, Va., on Lewisburg, 24 miles distant, to surprise Col. Geo. Crook who was encamped at that place with about 1,500 men. Heth marched through Union, crossed Greenbrier River, driving in Crook's pickets, and at 5 A.M. of the 23d formed line on a hill east of the town, Crook's camp being on the west side. Crook threw out a well supported skirmish line, which soon engaged Heth's advance; Heth at first had some success, but was gradually forced back; Crook charged his main line; a panic seized Heth's troops, and they fled from the field in disorder, retreating across the Greenbrier and burning the bridge behind them. Heth left on the field 38 dead and 66 wounded, four guns, and over 200 stand of small arms. Over 100 of his unwounded men were captured. Crook's loss was 13 killed, 53 wounded, and 7 missing. Consult: 'Official Records,' Vol. XII.; The Century Company's 'Battles and Leaders of the Civil War,' Vol. II.

E. A. CARMAN.

Lewiston, Maine, the second city in size in the State, 35 miles north of Portland, on the east bank of the Androscoggin River, and on the line of the Maine Central and Grank Trunk Railways; incorporated a town 18 Feb. 1795, with a population of 600; incorporated as a city 15 March 1861, with a population of 7,500 and organized 16 March 1863. This city is located in the heart of the Androscoggin Valley, a fertile and prosperous agricultural district. The city of Auburn, with a population of about 13,000, is located immediately opposite on the westerly bank of the river and the two cities are connected by four beautiful and commodious iron bridges, making them practically one community, with a combined population of 37,000. The railroad connections and facilities are of the best. Three great lines of steam railways converge here,—the Maine Central, Grand Trunk and the Portland and Rumford Falls. The Maine Central runs west to Portland and the seaboard, there connecting by water routes with Boston, New York and all Southern ports and by rail over the Boston & Maine with Boston, New York and all points south and west, and running east to Bangor, St. John and the Maritime Provinces. The same road has local branches extending to Franklin and Somerset counties on the north, Augusta, the capital of the State, and the Kennebec Valley on the east, and again connecting with the seaboard on the south at Bath and Rockland. The Grand Trunk also extends from here westerly to Portland and northerly to Montreal, thence to Chicago and the far West. The Portland and Rumford Falls road runs northerly through the beautiful Oxford region to Rumford Falls, thence into the heart of the celebrated Rangley Lakes District, one of the finest fishing and game preserves in the country. The Lewiston, Brunswick and Bath Street Railway, the largest electric street railway system in the State, is principally located here. It includes 57 miles of electric railway extending to the sea coast at Bath and connecting at Brunswick with the Portland and Brunswick Electric road to Portland and west.

Manufactures.— Although located in a fertile agricultural district, Lewiston is distinctly a manufacturing city. The Androscoggin River here has a fall of fifty feet and furnishes one of the most extensive water powers in the country. This power is utilized by means of an immense system of distributing dams and canals. The amount of power at the falls is 13,000 horse-power. About two and one half miles up river an immense dam has recently been constructed which adds 10,000 horse-power, making in all 23,000 horse-power available for use, the latter 10,000 horse-power is made available for use by electricity and is so distributed. The city's largest single industry is the manufacture of cotton cloth. Some of the largest manufacturing plants in the country are located here, and their various products are found in nearly all the markets of the world. Among them are the Bates Manufacturing Company, capital $1,200,000, operating 2,033 looms and 73,780 spindles; the Hill Manufacturing Company, capital, $1,000,000, operating 1,415 looms and 57,792 spindles; the Androscoggin Mills, capital $1,000,000, operating 70,000 spindles and 2,111 looms; the Continental Mills, with 2,360 looms and 90,000 spindles; the Avon Mill with 138 looms; the Libby and Dingley Company, capital $300,000, with 18,000 spindles. Their products are ginghams, bed spreads, fine dress goods, seersuckers, fancy shirtings and colored cottons, sheetings, twills, jeans, grain bags, drills, momie cloths, fine and coarse yarns, quilts, linen and cotton towelings, scarfs and table covers. There are three woolen mills located here — the Columbia Mills, operating 6 sets of machinery, 53 looms and a dye house; the Cowan Woolen Company, 8 sets of machinery, 46 looms and does its own dyeing; the Cumberland Mill with 6 sets of machinery, 40 looms and a dye house. The products of the woolen mills are blanket wrappers, cheviots, cassimeres, repellants and meltonettes. One of the largest and most noted bleacheries and dye works in the United States, the Lewiston Bleachery and Dye Works, is located here. Its capital is $300,000; its business, bleaching and dyeing cotton cloth.

In addition to the textile manufacturing industries there is one large boot and shoe factory and other small industries, the products of which are machinery and mill supplies for cotton and woolen mills, engines, boilers, brick, lumber, carriages, clothing, foundry products and agricultural implements.

Banks.— There are two national banks, two savings banks and one trust and safe deposit company. The capital stock of the two national banks and the trust company is $675,000, surplus $286,830.46. The deposits in the savings banks and the trust company are $4,805,805.

Government and Finances.— The government is vested by charter in a Mayor, Board of Aldermen and Common Council. The Mayor is elected by the entire vote of the city, while one Alderman and three Councilmen are elected from each of the seven wards into which the city is divided. All are elected annually on the first Monday of March and hold their offices for the term of one year. The administrative offices are partly appointed by the Mayor subject to confirmation by the Board of Aldermen and partly elected by the City Council, the latter body being composed of the Board of Aldermen and Common Councilmen. The schools are under the jurisdiction of a superintending School Committee of fourteen members,— two elected by the voters of each ward and holding their offices for the term of two years. The public waterworks are under a Board of Water Commissioners consisting of seven members, one elected annually in March by the City Council under authority of a State law, and holding office for a term of six years. The Mayor is ex-officio a member of the board. The Fire Department is under the control of a Board of Commissioners consisting of five members, the Mayor being a member ex-officio. The Board is created by a State law and one member is elected annually in March by the City Council and holds office for a term of four years. The highways, bridges, and sewers are under the control of a Board of Public Works created by State law and consisting of seven members, of which the Mayor is a member ex-officio. One member is elected by the City Council annually in February and the term of office is six years. The city owns its own waterworks. The supply is abundant, unusually pure and healthful and is taken from Lake Auburn, a beautiful and picturesque pond fed by springs and located in the city of Auburn, about four and one half miles from Lewiston. This city was the first in the United States to own and operate its own street lighting plant. The undertaking has proved a great success and many other cities in the country have since adopted the plan. The total assessed valuation of real and personal property in 1903 was $13,354,526; rate of taxation 20 mills; total municipal bonded debt $990,500; floating debt, $327,421.07.

Churches and Charitable Institutions.— There are 12 churches in the city, some of which are imposing edifices. Three are Roman Catholic, one Episcopal, one Baptist, one Friends, one Congregational, two Free Baptist, two Methodist and one Universalist. There is also a Jewish Synagogue. Two of the Catholic churches, Saint Joseph's and Saint Patrick's, are supported principally by Irish-American Catholics, while the third, Saint Peter's, is composed in membership of French Canadian citizens who number about 11,000 people in this city. In connection with the Catholic churches are maintained four large Catholic Parochial Schools, with a total membership of 1,400 scholars. These schools are under the superintendence of the Parish priests and are taught by the Sisters of Charity. Of the charitable institutions the more notable are the Sisters' Orphanage, the Healy Asylum, the Young Women's Home, the Home for Aged Women. There are two hospitals in this city,— the Central Maine General Hospital and the Hospital of the Sisters of Charity. Both receive substantial aid from the State. The Central Maine General Hospital is located in the heart of the city at the corner of Main and Hammond streets. The Hospital of the Sisters of Charity is on Sabattus Street, just at the edge of the thickly settled part of the city. Both hospitals are in elegant locations, and occupy imposing brick structures, commodious, well lighted and ventilated, with all modern appointments and improvements and high grade medical staff. The Sisters' Hospital is in charge of the Sisters of Charity, but is absolutely non-sectarian, its doors being open to all alike.

Education.— The public school system of the city is of the best and a source of pride to its citizens. The city gives an absolutely free education to its pupils from the kindergarten to the completion of the high school course. Its school buildings are numerous, conveniently located, with all the usual modern appointments,— some of the more recently constructed being among the best in the State. A new high school building was recently erected at a cost of $75,000, The total value of the school property owned by the city is over $300,000. The corps of teachers is selected with great care and a high standard of efficiency is required by the Superintending School Board. The results are highly satisfactory. In addition to the public schools are the Catholic parochial schools, where a high standard of thoroughness in instruction is maintained. Bates College is also located here. It is a co-educational institution and was the first college in New England to open its doors to women. The college is in a flourishing condition. It has nine excellent buildings, a faculty of 20 professors and a student body of nearly 300.

Miscellaneous.— The city has five excellent hotels, commodious, comfortable and well appointed; two fine theatres, a splendid public library, a beautiful City Hall, a new U. S. post-office building and a handsome public park, two live and ably conducted daily newspapers and one weekly, a progressive Board of Trade, and a population of thrifty, industrious, law-abiding and order-loving people. Pop. (1900) 23,761.

D. J. McGillicuddy.

Lewiston, N. Y., village, in Niagara County; on the Niagara River, and on the New York Central & H. R. railroad; seven miles north of Niagara Falls, and about 25 miles north of Buffalo. It has communication by steamer with a large number of lake ports, and is the terminus of a line connecting with Toronto. The famous Gorge Route from Niagara Falls, traversed by an electric trolley-line, connects at Lewiston by a suspension bridge with Queenstown, Canada, and other points of interest in the vicinity are the Devil's Hole and Bloody Run, Rumsay Park, and the Tuscarora Indian Reservation. The place where Lewiston now stands was the site of an Indian village. In 1720 the French took possession of the place, and built a blockhouse, but abandoned it in a few years, when it was again occupied by the Indians. Joseph Brant's home was in this vicinity. On 14 Sept. 1763 occurred the Indian massacre at Bloody Run, a place near Lewiston. The first white settlement was made about 1800, and in 1818 the town was incorporated, and in 1843 the village. On 19 Dec. 1813, Lewiston was one of the towns burned by the English and Indians, in retaliation for the burning of Newark (now Niagara), Canada West, by the Irish-American General McClure; numbers of innocent persons perished on both sides. The place is now a favorite summer resort. Pop. (1900) 697. Consult Pool, 'Landmarks of Niagara County.'

Lewistown, Ill., city, county-seat of Fulton County; on the Chicago, B. & Q. and the Fulton County Narrow Gauge R.R.'s; about 50 miles southwest of Peoria, and 60 miles north-northwest of Springfield, the State capital. It is situated in an agricultural region and is the trade centre of a large part of the county. Its chief manufactures are carriages and wagons, flour, lumber, brick, tile, furniture, and dairy products. Live-stock and farm products are shipped from Lewistown to the large markets. Pop. (1900) 2,504.

Lewistown, Md., a town of Frederick County, near the foothills of the South Mountains, 10 miles north of Frederick. Farming and dairy pastures are the chief industries. Pop. 270.

Lewistown, Mo., a town of Lewis County, on the Quincy, Omaha & Kansas City railroad, 26 miles northwest of Quincy, Ill. It is in a farming and stock-raising district. Pop. 358.

Lewistown, Mont., the county-seat of Fergus County, on the Missouri railroad, 100 miles southeast of Great Falls. Mining, farming, and stock-raising are extensively carried on in the neighborhood. Pop. 1,096.

Lewistown, Ohio, a town in Logan County, on a branch of the Detroit Southern railroad, 7 miles northwest of Bellefontaine. Pop. 200.

Lewistown, Pa., borough, county-seat of Mifflin County; on the Juniata River, and on the Pennsylvania railroad and on the Pennsylvania Canal, about 60 miles northwest of Harrisburg, the State capital. It is situated in a fertile agricultural region in which are valuable mineral deposits, especially of iron and glass sand. Lewistown is a trade centre for an extensive farming section; but it is also a manufacturing borough. The chief manufactures are steel, iron, flour, leather, lumber, foundry and machine-shop products, hydrants, and pumps. Lewistown and vicinity are now favorite summer resorts. Pop. (1900) 4,451.

Lexicog'raphy. See DICTIONARY.

Lexington, lĕk'sĭng-tŏn, Ky., city, county-seat of Fayette County; on the Lexington & E., the Southern, the Chesapeake & O., the Kentucky & I. B., and the Louisville & N. R.R.'s; about 82 miles south of Cincinnati, and about 22 miles southeast of Frankfort, the capital of the State. The first settlement was claimed by a party of hunters, who, in 1775, camped at this place and named it Lexington in honor of the battle of Lexington. They built a log cabin on the site so as to leave a proof of their ownership. Four years later Robert Patterson, one of the hunting party, made here a permanent settlement. Three years afterward the town was incorporated by the legislature of Virginia, as this section was then a part of Virginia. In 1792, when Kentucky became independent of Virginia, Lexington was made the capital of Kentucky, and the first Kentucky legislature met in this city. The city was granted a charter in 1832. Lexington is located in a fertile agricultural country, the famous «blue-grass» region. Its chief manufactures are Bourbon whiskey, harnesses, saddlery, flour, canned goods, lumber, carriages and wagons. Some of the important institutions are Kentucky University (Christian), Sayre Female Institute, Hamilton and McClelland Female Colleges, Saint Catharine's Academy (Roman Catholic), State Agricultural and Mechanical College, and the Kentucky Reform School. It has the State Asylum for the Insane, Saint Joseph's Hospital (Roman Catholic), Colored Industrial Home, and a Protestant infirmary. It has an excellent public library. The race tracks, the stock farms in the vicinity, the parks, all have made Lexington well known in connection with industries and amusements. Henry Clay made this city his home from 1797 until his death. Pop. (1890) 21,567; (1900) 26,369.

Lexington, Mass., town, in Middlesex County; on the Boston & M. railroad; about 12 miles northwest of Boston. The town contains the villages of Lexington, East Lexington, and North Lexington. Lexington was settled in 1642, was long known as «Cambridge Farms,» and was incorporated as a town in 1713. It was the scene of the first conflict between the colonists and the British troops in the Revolutionary War, on 18 April 1775. The British obtained the advantage and destroyed the stores of the colonists, but lost in the action 273 men killed and wounded. Lexington is situated in an agricultural region, and its industries are connected chiefly with the products of the farms and the trade necessary for supplying local wants. It has important leather-binding works. It contains many points of interest, some of which are the first battleground of the Revolutionary War, the monument commemorative of this battle; the Monroe Tavern, built in 1695, which was Earl Percy's headquarters; the old Belfry clubhouse; and the Hancock-Clarke house (1698), where Samuel Adams and Hancock lodged the night before the battle. The last mentioned building is now used as a museum for Revolutionary and early settlement relics. A number of monuments in honor of the men and events which made Lexington famous adorn the city. It contains the Cary Library with nearly 25,000 volumes; a fine high school, the Hancock and Adams grammar schools, a town hall, and a number of fine churches and elegant residences. The old burying ground, visited annually by hundreds of people, is mute witness of the noble people who have lived in this town. Pop. (1900) 3,831.

Lexington, Mo., city, county-seat of Lafayette County; on the Missouri River, and on the Missouri P. and the Atchison, T. & S. Fe R.R.'s; about 63 miles southeast of Saint Joseph and 39 miles east of Kansas City. The first permanent settlement was in 1825, and it was incorporated in 1830. Lexington was the scene of a siege in 1861, when a Confederate force of 18,000 under Gen. Sterling Price, attacked the city, which was defended by a Federal force of 3,000 men under Col. James Mulligan. The Federals surrendered on 20 Sept. 1861, but Price left the place a few days later, and put on guard a small force. On 16 October, a Federal force of 230 men under Major J. White entered the city, released the Union prisoners and took the Confederates captive. The city is in the midst of a fertile agricultural region, in which hemp is cultivated extensively. Coal is mined in the vicinity of the city. Lexington is the seat of the Central Female College, the Baptist Female College, and the Wentworth Military Academy. Pop. (1900) 4,190.

Lexington, Va., town, county-seat of Rockbridge County; on the north fork of the James River, and on the Baltimore & O. and the Chesapeake & O. R.R.'s; about 110 miles west by north from Richmond, and 44 miles northwest of Lynchburg. It is in a rich farming valley west of the Blue Ridge. Valuable deposits of sulphur ore are in the vicinity. The chief manufactures are dairy products, agricultural implements, flour, and lumber. The city owns and operates the waterworks. The water is brought some distance from springs in the mountains.. Lexington is the seat of the Virginia Military Institute, opened in 1839, and the Washington and Lee University (q.v.). Generals Jackson and Lee are buried here, and statues have been erected in their memory. The mineral springs in the vicinity are becoming popular resorts; the Natural Bridge (q.v) one of the natural curiosities of America, is about 15 miles south, separated from Lexington by low mountains or hills. Pop. (1900) 3,203.

Lexington, Siege of. After the battle of Wilson's Creek (q.v.), Mo., 10 Aug. 1861, Gen. Sterling Price, abandoned by McCulloch and his troops, appealed to the secessionists of Missouri to fill his depleted ranks; and about the middle of August he moved northward toward the Missouri River, skirmished with a force under Gen. J. H. Lane, 7 September, at Dry Wood Creek, drove Lane out of the State, and followed as far as Fort Scott, which had been abandoned. On the 10th he was at Rose Hill, from where he marched for Warrensburg, which was reached on the 11th, Peabody's 13th Missouri at that place retreating to Lexington. When Fremont, at St. Louis, heard of Price's northward movement, he ordered to Lexington a force which, when Price arrived at Warrensburg, numbered 2,800 men, with seven 6-pounder guns, under command of Col. James A. Mulligan, 23d Illinois. Mulligan took position and threw up intrenchments on College Hill, a bluff 200 feet above low-water mark, northeast of the city, overlooking it and the Missouri, and on which was a substantial brick building erected for a college. Immediately in front of the college was the first line of works, outside of which was a broad ditch, and beyond were «confusion» pits. On the morning of the 11th Price marched from Warrensburg toward Lexington, and that night, after a march of 30 miles, halted three miles from the city, where he rested until dawn, when he drove in Mulligan's pickets, and from four different points opened a cannonade upon the hastily constructed works around the college. After several sharp encounters the Confederates captured some outworks and drove Mulligan's men behind the main line. At the end of the day Price withdrew to the fair ground, two miles away, to await reinforcements and ammunition. Mulligan, looking for reinforcements, strengthened his position and prepared for a siege. Price was anxious because he knew of the approach of Union troops to relieve Lexington; but being reinforced to 25,000 men, and his ammunition coming up, he again moved on the city on the 18th, took possession, closed in upon Mulligan, and began a siege. Rains' and Parsons' divisions occupied strong positions on the east, northeast, and southwest of the works; Rives' division, supported by McBride's command and a part of Harris', moved along the river bank to a point immediately beneath Mulligan's works; fire was opened upon the Confederates from a dwelling on the bluff, 125 yards from the works; upon which the Confederates charged and took the house, and also the bluff immediately north of it. A gallant counter-charge by Capt. Gleason, with 80 men of the 23d Illinois, retook the house, but it was soon regained, and the adjoining heights fortified. Firing continued all day of the 19th; water gave out, but Mulligan encouraged his men to hold on until help arrived. On the morning of the 20th Price caused to be taken to the river heights a number of hemp-bales, with which movable breastworks were constructed. These were rolled forward; under cover of them the Confederates moved to within ten rods of the works; and at 2 P.M., after over two days' continuous fighting, Mulligan's men being without water or rations, and short of ammunition, a white flag was displayed, and Price ordered a cessation of firing. Mulligan had lost 42 killed and 108 wounded, and surrendered 1,624 men, 7 guns, many horses, and a large amount of stores. Price reported a loss of 25 killed and 72 wounded. Price remained at Lexington until 30 September, when, pressed by the Union advance from Jefferson City, he abandoned the place and retreated toward Arkansas, leaving a guard of 500 men with the prisoners taken. On 16 October a squadron of cavalry under Maj. F. J. White surprised the party, captured 70, and released the prisoners. Consult: 'Official Records,' Vol. III.; The Century Company's 'Battles and Leaders of the Civil War,' Vol. I.

E. A. Carman.

Lexow, lĕk'sow, **Clarence,** American lawyer and politician: b. Brooklyn, N. Y., 16 Sept. 1852. He studied abroad and at the Columbia Law School, graduating from the latter in 1872. He was admitted to the bar and established practice in New York city, receiving a large German-American patronage, and engaging in many important litigations. In 1882 he became a resident of Nyack, and was active in the Republican party there. In 1890 he was an unsuccessful nominee for Congress, but lowered the usual Democratic majority. In 1893 he was elected to the State Senate where he served till 1898. Here he at once became a leader, was chairman of the committee on internal affairs, and introduced the bi-partisan police bill calling for an investigation of the New York city police. This led to the appointment of the so-called «Lexow Committee», of which he was head; the investigations of this committee brought to light the system of protection of vice by the police in New York, and were the direct cause of the reform campaign and the election of Mayor Strong. Lexow was also the introducer of the bill creating the city of Greater New York, was chairman of the joint legislative committee for the investigation of trusts and unlawful combinations, of the committee on primary elections reform and of the judiciary committee. In 1896 he was chairman of the committee on resolutions at the Republican State convention, and introduced the gold standard plank in the platform; in 1900 he was a presidential elector. He is author of reports on 'Municipal Government' and on 'Trusts and Unlawful Combinations'.

Leyden, lī'dĕn, or **Leiden,** Netherlands, an important town in the province of South Holland, 22 miles by rail southwest of Amsterdam, on both sides of the Old Rhine, which flows through the town by several branches. The neighborhood is marked by wind-mills, country-seats, pleasure-grounds, gardens, and fertile meadows, and street railroads connect with the bathing resort of Katwyk, 5 miles to the northwest on the North Sea. The streets are straight, broad, and clean; Broad Street (*Breede-straat*) being esteemed one of the finest in Europe. In it is situated the town-hall (*Stadhuis*), originally founded toward the end of the 16th century, a picturesque building, with 30 windows in a line in front, a tall spire, and three highly ornamented projecting gables. In the council-chamber are the painting of the 'Last Judgment,' by Lucas van Leyden, and several good historical portraits; in part of the lower floor is situated the meat-market. None of the churches are remarkable; the Reformed Church of St. Peter contains monuments to Boerhaave, Spanheim, Scaliger, etc. The most important educational institution is the university, formerly one of the most famed in Europe, and still in excellent repute. It is attended on the average by about 800 students, nearly one half studying law. Connected with the university are a well-laid-out botanic garden, an observatory, a library, with numerous manuscripts, an anatomical theatre and museum of comparative anatomy, one of the richest collections of natural history in existence, cabinet of coins, museum of antiquities, and a rich Japanese museum. Leyden was noted for its cloth manufactures, which after 1670 declined, but have revived in recent years, now employing about 1,500 operatives. There are also various other branches of manufacture, and the former great trade in books, carried on in the latter part of the 17th and during the greater part of the 18th century, and rendered world-renowned by the Elzevirs, is represented by several printing offices. There is an extensive trade in agricultural produce, especially cheese and butter.

The most memorable event in the history of Leyden is the successful siege it maintained against the Spaniards in 1573–4 until relieved by the action of the Prince of Orange in breaking down the dikes. Leyden is the birthplace of John of Leyden, the founder of the Anabaptists; Camper, Muschenbroek, the brothers Gerard and Isaac Vossius, Gronovius, Rembrandt, Luke of Leyden, the brothers Van der Velde, Gerard Douw, etc. Pop. (1900) 54,421.

Leyden Jar. See Electricity.

Leys, Henri Jean Auguste, ŏṅ-rē zhŏṅ ō-güst līs, or lā, Belgian painter: b. Antwerp 18 Feb. 1815; d. there 25 Aug. 1869. He worked from 1829 to 1832 in the studio of his brother-in-law, Ferdinand de Braekeleer, and in 1833 exhibited in Brussels, ‘Fight Between a French Grenadier and a Cossack.’ He attracted still further attention by his picture ‘Fight of Burgundian and Flemish Soldiers.’ His style changed after his visit to Paris 1835; during which he confined himself to a study of the French Romantic school. Yet while the modern manner is discernible in his works, he shows himself also under the influence of Van Dyck and Rembrandt in such pictures as: ‘Flemish Wedding’; ‘A Painter's Studio’; ‘A Family Party in Brittany’; ‘Burgomaster Six at Rubens' House’; etc. In 1839 he still further modified his manner after traveling in Holland and familiarizing himself with the Dutch genre painters. It was certainly under their inspiration that he painted such pictures as ‘A Family Party’ (1845); ‘Divine Services in Holland’ (1850); etc. After completing his travels in Holland he still further changed his style and painted in the bizarre style of Quentin Matsys, whose naïveté and uncouthness he also reproduced. In 1863 he received a commission to decorate with frescoes the town hall of Antwerp, and this he fulfilled by producing a fine series of scenes from the history of the city. He was also an etcher, lithographer and wood engraver of acknowledged skill.

Leyte, lā'tā, Philippines, a province consisting of the island of Leyte and 40 dependent islands; area of Leyte 3,872 square miles; area dependent islands 342 square miles; total 4,214 square miles. Leyte lies southeast of Luzon, southwest of Samar, from which it is separated by the narrow strait of San Juanico, and northwest of Mindanao; its extreme length from northwest to southeast is 121 miles. The two most important dependent islands are Biliran, area 144 square miles; and Panaón, area 76 square miles. They are both mountainous; Biliran is noted for its sulphur springs; Panaón is well populated and has some gold deposits. The interior of the island of Leyte is mountainous, there being a number of extinct volcanoes, and the island is crossed by a number of large rivers; the coast line is irregular, indented by a number of bays, some of which afford excellent harbors, among the best in the Philippines. There are numerous roads on the east coast, and the west coast is also paralleled by roads and trails for almost its entire length; the rivers furnish good inland transportation. The province is one of the best cultivated in the archipelago; the most important product is hemp and many of the plantations being under cultivation for almost 50 years require little work, the crop being abundant and of excellent quality; other products are rice for home use, chocolate, sugar, coffee, and corn. The mineral products include sulphur, gold, iron, lead, and silver; of these the most important is sulphur, which supplied the gunpowder works at Manila under Spanish rule. There are also valuable forests; the yield of dammar, the brea or pitch of the Spaniards, is the most important in the Philippines. The largest industries are the manufacture of abaca and the cabonegro or black boat cables from the hemp, and the extracting of cocoanut oil. There are also ship-building yards at Tacloban, at which good sized schooners are often built, and weaving of fine fabrics by the women. Civil government was established in April 1901; the people proved generally favorably inclined to the new regime, and there was renewed activity in every line of industry; before December of that year the United States troops were withdrawn from a number of the towns, which had been garrisoned, and they were protected entirely by the native police. Pop. 270,500, mostly Visayan.

Lhasa, lhä'sä or **Lassa,** lăs'sä, Tibet, the capital of the country, and the «Rome» or «Mecca» of Buddhism, its name signifying the «Place of God,» is picturesquely situated in a valley plain surrounded by mountains rising from the Ki-chu, a left affluent of the Sanpo or Upper Brahmaputra, about 280 miles in a direct line northeast of Darjiling. Access being exclusively forbidden to Europeans, three only having visited it during the 19th century, the place has a mysterious celebrity, which has been enhanced by unsuccessful western attempts to reach it. The most recent information has been obtained from native Hindu pilgrims and explorers in the employ of the British Government. Broad roads lined by luxurious gardens lead past the well-built houses of the suburbs to the closely guarded gates of the walled city, which is dominated by the imposing Potala hill-palace, and other hill-top edifices. The principal streets of the city are wide, regular, and clean, lined with well-stocked stores and houses of two and three stories; but the side streets and lower parts of the town are very dirty and daily crowded by importunate beggars. The houses are built of stone, brick, or earth, terraced at the summit, and uniformly whitened externally, the windows and door-frames being painted with the sacred or *lamanesque* colors, red and yellow. Internally, however, they are exceedingly dirty and comfortless. The public edifices worthy of notice are connected with Buddhist monasteries. In the heart of the city is the convent of Moru, with a large printing establishment, from which numerous religious works are issued; and on the outskirts, toward the cardinal points, are four other large monasteries — Praebung on the west, Sera on the north, Khaldan on the east, and Samie on the south or southeast side. All these have several thouand inmates, being greatly resorted to from China, Turkestan, Nepal, etc., as schools of philosophy and Buddhism. About 1½ miles northwest from the city, and connected with it by two avenues of trees, is the Potala, Bottala, or Buddha-la, the residence of the Dalai or Talé (Grand) Lama, the ecclesiastical sovereign of Tibet, and supreme pontiff of the vast regions forming central, eastern, and southeastern Asia. A triple-peaked hill here rises abruptly out of the plain to the height of 367 feet; it is covered with convents and cells of monks, and in the centre is the palace of the Dalai Lama, a fine edifice, four stories in height, with a vast number of apartments and a large dome, which, like the columns of the peristyle surrounding the structure, is covered with gilding. The interior is full of idols, treasure, and works of art. Lhasa is the principal emporium of Tibet, and a rendezvous of people from all parts of Asia; silk stuffs, tea and other articles being here exchanged for Tibetan, Indian, and European goods. British troops under Col. Younghusband were ordered into Tibet in the autumn of 1903, apparently to occupy Lhasa, and thus control the entire Buddhist population of Asia, in behalf of British interests. Pop. of city estimated at 15,000, but in addition there are a large number of Buddhist lamas or priests, and students in the monasteries.

L'Hôpital, Guillaume François Antoine, gē-yōm frän-swä än-twän lō-pē-täl, MARQUIS DE ST. MESME, French mathematician: b. Paris 1661; d. 2 Feb. 1704. He devoted himself exclusively to the study of mathematics, having had Jean Bernouilli for a short time to give him instructions in the differential and integral calculus, and at the age of 32 distinguished himself by solving problems proposed to the lovers of mathematics by Jacques Bernouilli; and 1693 was admitted an honorary member of the Academy of Sciences at Paris. From that period he published, in the French and foreign journals, solutions of difficult questions, and other mathematical communications. Such was his reputation that Huygens, profound as was his acquaintance with science, applied to L'Hôpital for information relative to the nature of the differential calculus. This led to the publication of his 'Analyse des Infiniment Petits' (1696), the first French work on the subject, of which a new edition was published by Lefevre (1781). Besides the work mentioned he was the author of 'Les Sections Coniques, les Lieux Géométriques, la Construction des Equations' (1707); and 'Une Théorie des Courbes Mécaniques.'

L'Hôpital, Michel de, mē-shĕl dė, French statesman: b. Aigueperse, Puy de Dôme, France, about 1504; d. Chateau Bellebat, near Etampes, France, 15 March 1573. He studied law in Italy, and returning to France was president of the court of accounts in 1554, and chancellor of France in 1560. To his moderate policy were due the edict of Romorantin, 1560, which prevented the introduction of the Inquisition in France; the edict of pacification, 1562, authorizing the free exercise of Protestant worship; and the ordinance of Moulines, 1566, which aimed at reform in the administration of justice. Distinguished for his integrity and moral courage, L'Hôpital stood far in advance of his time in his support of toleration and civil liberty. He gave up his office in 1568.

Li, lē, or **Cash,** a copper coin of China, with a square hole in the middle, and an inscription on one side. The value of a li in American money is about ⅛ of one cent. Li is also a Chinese measure of length equal to about one
of an English mile.

Li Hung Chang, lē hoong chäng, Ch
statesman and diplomatist: b. Lu-chow,
vince of Ngan-hwei, 16 Feb. 1823 (or pe
1819); d. Peking 7 Nov. 1901. He recei
thorough education, passing through the
cessive grades of scholarship, with the
examinations which in China must be unde
before admission to the literary caste, «ahe
15,000 competitors». In 1847 he receive
third degree, and entered the Hanlin Coll
1849. In 1850, when the Tai-ping rebels in
Ngan-hwei, he joined Tseng Kuo Fan's
as secretary. He was appointed judge of
kiang province, and in 1861 governor of
su. In 1863, in conjunction with Colonel (
ward General) Charles George Gordon (
known as «Chinese Gordon», he retook Su-
and drove the rebels entirely out of Kia
Gordon's force, the «Ever-victorious A
had previously been commanded by Fre
T. Ward, an American soldier of fortune
was largely composed of foreigners.
them Li Hung Chang derived much inform
concerning Europeans, and also acquire
creased military knowledge and ideas of w
political ethics. For his services in suppr
the Tai-ping rebellion Li was made comm
of the imperial forces, head of the navy,
editary noble, and received the highest de
tions in the gift of the emperor. In 18
was appointed governor of the Kiang prov
During the Nien-fei rebellion (1868) he
degraded for apathy in the face of the e
but was soon restored to favor. In 1872,
the massacres at Tien-tsin, followed b
stern measures of redress, he was app
viceroy of Chi-li, the metropolitan pro
During his long service in that office he r
at Tien-tsin, where he displayed his progr
designs by many improvements, among
were a great canal and the forming of the
nese Merchants' Steam Navigation Com
Here for 24 years (1870–95) he exercis
power in reality second only to the empe
controlling the foreign policy of the e
and introducing modern tendencies from
ern civilization. He negotiated imp
treaties with Japan, Peru, and other cou
increased the military strength of China in
of foreign encroachments, and may be sa
have created the Chinese navy. He was i
ial commissioner of trade for the northern
the emperor entrusted to him supreme c
of the military and naval forces sent to
in the Chino-Japanese war; and though s
times distrusted and disgraced, he bore
the whole burden of the war, marine, and
cial departments of the Chinese govern
During the war with Japan the disasters t
Chinese armies and navy were laid to his c
and he was degraded and punished, but
retained his office of prime minister. He
sent to Japan in 1895 to negotiate the
treaty, and barely escaped assassination.
ing represented China at the coronation of
olas II. of Russia in 1896, he made a tour
world, and was everywhere received
highly distinguished guest. After the suppr
of the uprisings of 1900–1 he played a p
nent part in adjusting the relations of
with foreign powers.

LI HUNG CHANG.

The official integrity of Li Hung Chang has not gone unchallenged, although specific acts of corruption were never proved against him. Craftiness was conspicuous in his character and political acts; but however his conduct may have been inspired at different times, there is no question in regard to the great services which, through his extraordinary abilities and opportunities, he rendered to China and to the world. The extent of his immense private fortune has never been exactly known. His shrewdness and thrift were shown in the curious fact that while acting so great a part in China for so many years he also held control of all the pawnshops in the empire. If he were «the buffer between China and the rest of the world» on the side of practical usefulness to his own country the scope of his work is seen in the influence which he exerted in behalf of modern progress; in the machine-shops which he established; the cotton-mills, fitted with foreign machinery; the bicycle factory that he built; the telegraph lines he constructed; the coal mines he opened; the arsenals he erected; the fortifications which he equipped with foreign guns; the modern firearms and military organization and instruction which he introduced; his gunboats and ironclads of foreign construction; railroads built under his direction; above all in the establishment of schools for the introduction of modern improvements and appliances; in the founding and endowment of a hospital, etc. These things showed in him a spirit and a purpose new to the official world in China, and from whose initiative still greater results may be expected. Consult Douglas, ‘Li Hung Chang’ (1895).

Liability Insurance. See Insurance, Casualty.

Lia-fail, or **Stone of Destiny,** a broad gray stone on which the kings of Scotland were crowned in the Abbey Church of Scone. In 1296 Edward I. carried it to England and it still remains under the coronation chair in Westminster Abbey. Tradition says it is the stone which the patriarch Jacob used as a pillow.

Liakhof Islands. See New Siberia.

Lian'as, climbing and twining plants found in profusion in tropical climates, where they form thick, woody stems. In many instances they overtop the heads of the tallest trees, when they descend and intertwine the entire forest by their cable-like shoots, frequently forming an impenetrable network or matting, which it is necessary to break through with the hatchet. The thickness of the stems of some of the species of lianas becomes so great that their constriction kills the tree to which they originally adhered, and when this has fallen the magnificent confusion of leaves and flowers presents one of the most striking features of those forest scenes. Vanilla, sarsaparilla, and other medicinal plants are true lianas.

Li'as, in geology, a formation consisting of thick argillaceous and calcareous deposits, which constitute the base on which the oölitic series reposes. It is generally regarded as the lowest division of the Jurassic system, and it rests on the Triassic series. The upper portion of these deposits, including about two thirds of their total depth, consists of beds of a deep blue marl, containing only a few irregular limestone beds. In the lower portion the limestone beds increase in frequency, and assume the peculiar aspect which characterizes the lias, presenting a series of thin stony beds, separated by narrow argillaceous partings, so that the quarries of this rock at a distance assume a striped and ribbon-like appearance. The lias is remarkable for the number and variety of its organic remains, among which are belemnites, ammonites, gryphites, and other shells, together with the remains of saurian or lizard-like animals, of which the ichthyosaurus and pleiosaurus are familiar examples. In the United States the lias is found in Oregon and California. The lias crosses England from near Whitby, in Yorkshire, to Lyme, in Dorsetshire. See Geology.

Li'atris, or **Lacinaria,** a genus of plants of the thistle family containing about 16 species of tall perennial herbs growing in dry soil throughout the eastern and central United States and known as blazing-stars and button-snake roots, in reference to their globular tubers. They bear late in the season dense spikes of purplish flowers, often in the south a foot in length and of a delicate lavender tint very effective when seen in a mass of goldenrod or autumnal grasses. Gray-feather is another name indicating the conspicuous beauty of such fine species as the blue *L. scariosa* or *L. squarrosa*. The latter is known as colic-root, and all are in repute among the southern country folk, not only as good family medicine in the form of a decoction made from the root, but as a specific against rattlesnake venom.

Libanius, lĭ-bā'nĭ-ŭs, Greek sophist and rhetorician: b. Antioch 314 A.D.; d. there 395. He taught rhetoric at Constantinople, where his school drew such vast numbers of students that his rivals caused him to be expelled from the city as a sorcerer. He subsequently returned to Antioch, and there passed his latter days. He was highly esteemed by the emperors Julian, Valens, and Theodosius. He was a pagan, but maintained friendly relations with many Christians, including St. Basil and St. Chrysostom, who were his pupils. He was a voluminous author, and several of his works are extant, but there is no complete edition of them. Consult Sievers, ‘Das Leben des Libanius’ (1868).

Liba'nus, Mount. See Lebanon.

Liba'tion. Among the ancients libation was properly a drink-offering; but was used also for other offerings to the gods, as a meal-cake, or something similar placed on the altar, and a part of which was burned. Libations were also made at domestic meals, some of the food being thrown into the fire on the hearth in honor of the Lares. A libation always accompanied the sacrifice offered in concluding a treaty with a foreign nation. The libations to the dead were not performed till the ninth day after the burning or interment, and consisted of milk, wine, or blood, and generally concluded the funeral solemnities.

Libau, lē'bow, Russia, an important seaport in the government of Courland, on the Baltic, on a narrow strip of land between the sea and a small lagoon. It has rapidly increased in recent years and become an important centre of industry as well as of trade. A great naval harbor has been constructed, and ship-building, especially of ocean-steamers is carried on. It exports grain, linseed, flax, hemp, timber; and imports colonial produce, manufactured goods, coals, etc. Pop. (1897) 64,505.

Lib'bey, William, American scientist: b. Jersey City, N. J., 27 March 1855. He was graduated from Princeton in 1877 and since 1880 has been professor of physical geography there. He is a fellow of the geographical and geological societies of London and Paris.

Lib'by, Laura Jean, American novelist: b. New York 22 March 1862. She was married to Van Mater Stilwell in 1898. Her earliest writings were contributed to the New York Ledger and other story papers. Among her many fictions are: ‹Lovers Once but Strangers Now›; ‹When His Love Grew Cold.› The literary merit of her work is very slight.

Libby Prison, a famous prison at Richmond, Va., during the Civil War. It was a large brick structure named for its owner who used the building as a ship chandlery before the War. The Confederate government early secured it as a military prison for Federal soldiers, and many thousands were confined here. In 1863 and 1864 there were many deaths from disease and lack of food. In 1892, the building was torn down and removed, brick by brick, to Chicago, and set up there as a museum, but the enterprise proved a failure.

Libel, (1) a defamation of a person, with malice expressed or implied, made public by means of writing, printing or pictures, calculated to provoke him to anger, or expose him to hatred, ridicule or contempt. Spoken words, however opprobrious or injurious, do not amount to libel but are classed as slander; and, being more limited in their publicity, the offense is not so great as in a case of libel. There may be a libel by traducing the memory of one who is dead, as well as one which attacks the reputation of one who is living. Any publication which has a tendency to disturb the public peace or good order of society, is actionable as a libel, and may usually be prosecuted by either a civil action for damages or by a criminal proceeding, and both remedies are often pursued at the same time. In the absence of some statutory provision on the subject, proof of the truth of the matter contained in the libel does not ordinarily furnish a good defense to the offending party. The publication may be very limited and yet amount to the offense. The malicious reading of a libel to one or more persons has been held sufficient and the sale of each copy of a book containing a libel has been pronounced by a court as sufficient to furnish a distinct offense. Libels against the government consist of calumnious publications in denunciation or unwarrantable criticism of the established governmental system or in censure of methods of administration, provided the allegations are of such a nature that their natural tendency or evident purpose is to promote disaffection among the citizens or to excite a spirit of revolution. But indictments for libels of this character are very rare, and would not be resorted to except in extreme and very plain cases. Many of the States have enacted statutes upon the subject of libels, declaratory of the old common law rules, with ancillary provisions, relating principally to forms of administration, with provisions as to punishment. A libel may be a misdemeanor only, or a felony, according to the chara
the offense.

(2) Libel in admiralty practice deno
complaint or pleadings by which an ac
commenced, to enforce some claim or r
a marine matter, and contains a circum
statement of the claim. The general sc
the jurisdiction of admiralty embraces
rine contracts and maritime torts, includi
tures in time of war, and seizures for
forfeitures, and all duties appertaining to
commerce and general navigation. The
jurisdiction in torts is determined by th
where the same were committed. Such
is not required to be drawn with any
of technicality, the substance being mo
portant than the form. In the United
substantially all admiralty matters are
acted in the Federal courts. The plain
moving party in an admiralty proceed
called the libellant, and the defendant, o
against whom the proceeding is brou
termed the libelee or respondent. Son
a libel is directed *in rem* or against p
only, without naming a respondent.

HENRY HARDW

Liberal Party, in politics, the party
claims to be distinctively that of refor
progress with a view to vast increased p
power in the people, and to extend pri
to the masses. Most European countries
liberal party, but in several of them, s
Germany, Belgium, and France, liberalis
lost heavily owing to the rapid spread of
ist doctrines, which involve economic a
dustrial rather than political reform. In
Britain, Liberal and Conservative ministri
low each other at irregular intervals, a
the whole the system has worked well.
greatest of modern Liberal leaders was
stone, but his introduction, in 1886, of th
Home Rule and Land Purchase Bills al
many of his supporters, and led to the
tion of the Liberal Unionist Party. On th
tion of the war policy in South Afr
1899–1901 the Liberal opposition was spl
several groups, such as the Liberal Impe
who supported the government; the so
«pro-Boer» Liberals, who opposed th
throughout; and those who, like Sir
Campbell-Bannerman, tried to combine
policies.

Liberal Republican Party, in Am
politics, a party organized in 1872 by R
cans, who were dissatisfied with General
first administration as President. At
vention held by them in Cincinnati, in tha
Carl Schurz was elected its president,
platform adopted demanding civil servi
form, local self-government, and univers
nesty, recognizing the equality of all me
ommending the resumption of specie pa
etc. Horace Greeley and B. Gratz Brow
named for President and Vice-President.
platform and these nominations were a
by the regular Democratic convention
year, but dissensions arose, and other can
were nominated, the result being that t
publican nominee, General Grant, was
by an overwhelming majority and the
Republican party was thereafter pra
dead. The real strength of the party lay
presidential candidate, Horace Greeley, w

a large following, particularly of the farming element throughout the country, which was secured through the large and widespread circulation of the New York 'Weekly Tribune,' of which Greeley was the editor. See also GREELEY, HORACE.

Liberal Unionist Party, in British politics, a party formed in 1886 by the Liberals under the leadership of the Marquis of Hartington who objected to Gladstone's Irish Government and Land Purchase bills, as being dangerous to the empire. They gained their immediate object by coalescing with the Conservatives, and in the election which followed the defeat of the Gladstonian ministry they succeeded in returning some 80 members to parliament. They have since acted with the Conservatives.

Liberator, The. See GARRISON, WILLIAM LLOYD.

Liberia, lī-bē'rĭ-a, Africa, a negro republic on the west coast between Sierra Leone and the Ivory Coast. A convention with France in 1892 fixed the Cavally River as the southeastern boundary, and restricted the inland territories of the republic. The area is estimated at 35,000 square miles. It was founded as a colony of free blacks by the American Colonization Society in 1820, under the philanthropic idea that many, if not all, of the liberated slaves would prefer returning to Africa to staying in America, where, at that time, they were denied political rights. Liberia was declared an independent state in July 1847, and in the following year was recognized as such by Great Britain and France, when a treaty of trade and commerce with the state was concluded. A large proportion of the inhabitants speak English. The government of the country is on the model of that of the United States, consisting of a president, a vice-president, a senate, and a house of representatives. It is provided that on the increase of the population each additional 10,000 shall have a representative. For political and judicial purposes the republic is divided into counties and townships. The counties are four in number, and called Montserrado, Grand Bassa, Sinoe, and Maryland. Each town is a corporation, with elected municipal officers. Monrovia (pop. 13,000), the capital and port of the colony, is situated on Cape Mesurado. There are besides a number of towns or villages in the territory.

The general line of the coast (about 500 miles) is from northwest to southeast. There are several inlets and harbors at Cape Mount, Cape Mesurado, Cape Palmas, and Basa Cove. There are many rivers, of which the principal is the St. Paul, which enters the ocean at Cape Mesurado. It is about half a mile wide, and at low tide has seven feet of water on the bar at its mouth. It is navigable only about 18 miles from the sea. The other largest rivers are the St. John, which empties at Bassa Cove; the Junk River, which runs between the St. Paul and the St. John; Cape Mount River, which flows into the sea at Cape Mount; and the Grand Sesters, east of the St. John, which has 14 feet of water over the bar at its mouth. The land on the coast is generally low and sandy, except near the capes, which are elevated, and in the southeast, where the shore is bold and rocky. From the coast the land gradually rises, until at the distance of 30 miles inland it swells into forest-covered hills, and in the remoter interior into mountain ridges divided by fertile valleys. The soil is generally good, though there is some poor land. It is of a yellowish color, and tinges the rivers which flow through it. There is little swamp land, the country being almost universally broken and rocky or gravelly. The climate is that common to regions near the equator. There are two seasons, the wet and the dry. The former begins with June and ends with October. Rain falls during the greater part of this season, though not without intervals of clear skies and successive days of fine weather, especially in July and August. In the dry season rain is rare, though there are occasional showers. The average heat of the year in Monrovia is 80° F., that of the rainy season being 76° and of the dry 84°. The mercury seldom rises above 90° in the shade and never falls below 60°; the daily variation seldom exceeds 10°. June is the coolest month, and January the hottest. During the hottest months, January, February, and March, the heat is mitigated by the constant winds, the land breeze blowing from midnight until near midday, and the sea breeze from midday until near midnight. The climate both on the coast and in the interior is deadly to the white man, and though less fatal is still formidable to the black man born and reared in temperate regions. To the white man there is no acclimation in Liberia; the first attack of fever does not secure him from subsequent attacks. To the natives the climate is not unfavorable; they are robust and have few diseases, and many of them live to a great age. Iron ore abounds in Liberia, and copper and other metals exist in the interior of the country. The vegetables are almost endless in their variety. The most important of the native trees are rosewood, teak, mahogany, hickory, poplar, brimstone wood (so called from its yellow color), sassa wood, and many others valuable in ship-building and cabinet work. Camwood and other dyewoods, ebony, the acacia which yields gum-arabic, and the copal trees are found. There are several varieties of palm, all highly useful, especially the nut-bearing palm from which palm oil is made. Medicinal plants abound; among them are the copaiba tree, the *Croton tiglium,* which yields the croton oil, the castor oil plant, and the *Ricinus major,* whose seeds produce a highly purgative oil, and whose wood is much used for hedges and fences. Several varieties of maize and rice of excellent quality are cultivated, and on the highlands of the interior good crops of wheat, barley, and oats have been raised. Cotton flourishes, and sugar-cane and excellent coffee are easily produced. The esculent and farinaceous roots chiefly cultivated are the sweet potato, the cassava, the yam, the tenia, which in flavor resembles the potato, and the arrowroot. Cabbages, beans, peas, tomatoes, beets, cucumbers, and almost all the common garden vegetables known in America, thrive when planted in the proper season. The fruits are numerous and fine. Among them are the mango, lemon, lime, orange, guava, tamarind, pomegranate, cocoanut, plantain, banana, rose apple, African cherry, pineapple, avocado pear and the African peach. Wild animals are scarce, the elephant, hippopotamus, leopard, crocodile, boa constrictor, and deer, formerly abundant, being now rarely met with. Monkeys, guanas, chameleons, lizards, and ants in great variety, abound in the forests. The driver ants, which travel from place to place in countless multitudes, are welcomed by the people, for when they enter a house they soon clear it of every other species of insect and vermin. The Liberians build coasting-vessels, and possess a number of large vessels trading with Great Britain and the United States. An export and import trade is carried on, and a large number of the inhabitants of the interior depend upon Liberia for their supplies of European goods. The more important articles of export are coffee, sugar, palm-oil and palm kernels, cocoa, arrowroot, caoutchouc, ivory, kola nuts etc. The total value of the trade, however, does not probably exceed $2,500,000.

The population amounts to 2,060,000 of whom 60,000 are liberated American slaves and their descendants, the remainder indigenous negroes, including the Kroomen (q.v.). No white man is allowed to acquire citizen's rights or to hold property. There is no standing army, but all citizens capable of bearing arms are enrolled in the militia. Slavery is declared illegal. Complete religious toleration exists, the Methodist forms prevailing. English money is current, though accounts are kept in dollars and cents; and English weights and measures prevail. The financial condition of the republic has been deplorable; latterly there has been a change for the better. In 1893 the revenue derived chiefly from customs duties was $185,345 while the expenditure mainly for administrative purposes was $188,187, in 1900 the revenue was $218,804, and expenditure $207,935. The state debt contracted in 1871 amounted to $500,000 at 7 per cent on which the unpaid interest alone in 1899 amounted to $892,500. In that year an agreement was effected for the reduction of the rate of interest, the amortisation of the principal, and the payment of arrears; duties on rubber and other articles being assigned as security. In 1902, by this arrangement the debt amounted to $391,250 and the arrears of interest to $93,735. The arrears of interest on the internal debt, however, exceed the principal. The republic unfortunately is not in great favor with the native negroes, nor with those of the United States, although a few immigrants still arrive annually. Not only have the Liberians failed to make any impression on the aboriginal inhabitants, whom they were supposed to civilize, but, notwithstanding many honorable exceptions, they are lazy and quarrelsome, and unfortunately there is a general tendency in many respects to relapse into barbarism. About six square miles only of the territory is effectively administered. Consult, Blyden, 'A Chapter in the History of Liberia' (1892); Bourzeix, 'La République de Libéria' (1887); Büttikofer, 'Reisebilder aus Liberia' (1890); Delafosse, 'La République de Libéria' (1900); Durham, 'The Lone Star of Liberia' (1893).

Liberius, pope: b. Rome; d. there 24 Sept. 366. He was pope from 352 to 366; is one of the pontiffs that have incurred the accusation of heresy. It is conceded that he suffered an exile of two years by order of the Emperor Constantius for refusing to subscribe to a condemnation, by the Council of Arles (354), of the great champion of the Niceno-Constantinopolitan creed of the homoousion, St. Athanasius. But it is alleged that he obtained his recall by subscribing to a heretical, formally Arian confession of faith drawn up by an assembly of bishops at Sirmium. As there were three councils of Sirmium and three Sirmian confessions, the question arises, what was the tenor of each, and which one was subscribed by Liberius. The first council was held in 351; its confession is orthodox in its terms, but it does not employ the orthodox shibboleth homoousion. The second was held in 257: its confession is emphatically Arian. The third confession is Semi-Arian and heretical: but as it was formulated in 358, after Liberius' return from exile, that could not be the confession signed by him. Did he sign the second? No; for St. Hilary (300–368) a principal authority for these transactions, states that the confession signed by Liberius was drawn up by 22 bishops, among them Demophilus; and Liberius himself says that it was formulated by eastern bishops and presented to him by Demophilus, one of them: the confession signed by Liberius must have been this first (and orthodox) Sirmian confession; for the second was the work of western bishops or approved by them — Valens, Ursacius, Hosius, Germinius and Potamius.

Libertad, lē-bĕr-täd', Peru, a department bordering on the Pacific Ocean, with the departments of Lambayeque, and Cajamarca on the north, Loreto on the east, and Ancachs on the south. It is mountainous, with a narrow strip of level land along the coast. The Marañon, the head stream of the Amazon, waters its eastern slopes. Area, 10,206 square miles; pop. (1896) 250,931. Capital, Trujillo.

Lib'ertas, the goddess of freedom. By the Greeks she was invoked by the synonymous title Eleutheria. At Rome, her most famous temple was situated on the Aventine Mount. She was represented under the figure of a woman holding in one hand a cap, the symbol of liberty, and two poniards in the other. In ancient times Roman manumitted slaves put on what was termed the Phrygian cap, in token of their freedom. In modern times, a cap is also used as a symbol of liberty; thus, in France, a red cap formed the badge of the Jacobin Club. In England, a blue cap with a white border is used as a symbol of the constitutional freedom of the nation.

Lib'ertines, or **Liberti'ni**, a sect of fanatics in the 16th century in the Netherlands and Belgium, who maintained that nothing is sinful but to those who think it sinful, and that perfect innocence is to live without doubt. They advocated community of goods and gave themselves the name of «Spirituals.» The name was also applied in England to the early Anabaptists about the middle of the 16th century.

Lib'erty, Mo., city, county-seat of Clay County; on the Hannibal & St. J. and the Chicago, M. & St. P. R.R.'s; about 15 miles, by rail, northeast of Kansas City. It is situated in an agricultural region, and its chief manufactures are flour and dairy products. Its trade is principally in grain, vegetables, fruit, and live-stock. It is the seat of the William Jewell College, opened in 1849 under the auspices of the Baptists, and of the Liberty Ladies' College opened in 1890. Pop. (1900) 2,407.

Liberty Bell, the bell which formerly hung in the dome of the old State House (Independence Hall), Philadelphia, and was rung to announce the signing of the Declaration of Independence, 4 July 1776. It was cast in England especially for the State House, and was brought from there in 1752; in being taken from the ship it met with an accident which spoiled its tone, and it was recast in Philadelphia in 1753, when the words «Proclaim liberty throughout all the land unto all the inhabitants thereof» were inscribed on it. When the British occupied Philadelphia, the bell was taken down and hidden in the Delaware River near Trenton, but was afterward hung in its old position, and for several years rung every Fourth. In 1835 it was broken while tolling for the death of Chief Justice Marshall. In 1854 it was placed in the hall of the old State House on a pedestal with 13 sides representing the number of original States. In 1893 it was carried to Chicago for the World's Fair, and in many cities through which it was carried was greeted with special demonstrations; and has since been specially exhibited in other cities. Consult: Belisle, ‹History of Independence Hall.›

Liberty Boys, a popular name given the Sons of Liberty during the American Revolution.

Liberty College, a coeducational institution, founded at Glasgow, Ky., in 1875, under the auspices of the Baptist Church. In 1902, the number of instructors connected with the school was 11 and the number of pupils 250. The grounds and buildings were valued at $25,000. The amounts received from tuitions and other fees were $6,500.

Liberty, Equality, Fraternity, a well-known motto of the French Republic, dating from the time of the first revolution. Equality, in this connection, means equality before the law and the absence of class privileges. The motto gives title to a work by Sir J. F. Stephens (1873).

Liberty Party, the first political organization of the American Abolitionists (q.v.). The Anti-Slavery Society was composed of two wings steadily and at last decisively diverging: the politicals, who wished the work to be carried on as other reform measures are, by massing its supporters, and either winning a decisive victory or extorting gradual compromises from its opponents: and the Garrison wing, who refused to vote, hold office, or in any way recognize a government which legitimated slavery, denounced the Constitution, and denounced the churches and ministers for refusal to join the movement. The violence of this branch, and even more the revolutionary and sometimes offensive social theories associated with it, made the other anxious to part company; and they brought this about by having the annual report in 1838 suggest the nomination and support of abolitionist candidates. The next year, on the refusal of the Garrisonians to listen to this, the political wing split away, and in 1840 organized the «American and Foreign Anti-Slavery Society.» Among the leaders of this secession were James G. Birney, Arthur Tappan, Gerrit Smith, J. G. Whittier, Edward Beecher, John Jay, and Thomas Morris. In a convention at Warsaw, N. Y., 13 Nov. 1839, this branch nominated Birney (a Kentucky ex-slaveholder) for President, and Francis J. Lemoyne for Vice-President. A national convention (mainly from New York) was held 1 April 1840, confirmed these nominations, and took the name of the Liberty party. The nominees refused to accept, but were voted for none the less, and received 7,059 votes in the Harrison-Van Buren election of 1840, of which 2,798 were from New York State. During the next four years the party put up tickets in various local elections. On 30 Aug. 1844 it held another national convention at Buffalo. Polk was already nominated by the Democrats, on the issue of Texas annexation, which Clay had dodged and secured the nomination by the Whigs; but the Liberty Party had pronounced against all ostrich policies or candidates, and nominated Birney again, with Thomas Morris of Ohio as Vice-President. They received 62,300 votes, all in the North and Northwest, 15,812 in New York. Small as this vote was, it turned the scale in New York and Michigan against Clay, and elected Polk, the Southern Democrat; decided the annexation of Texas, and reinforced the slave party with new territory six times the size of New England. This result, however it might prove the potential power of the party, was not wholly satisfactory, and it was evident that a pure Abolitionist party was premature. The Abolitionists, therefore, dropped their separate organization, and in 1848 and 1852 voted for the candidates of the Free Soil Party (q.v.) accomplishing much more by strengthening the forces of this practical movement, whose enemies were constantly playing into their hands, than they could have done with the other. After the rise of the Republican party they formed part of its reliance and its advance guard, but always with a certain separation of feeling and even of organization.

Liberty, Statue of, the name of a colossal statue on Bedloe's Island in New York harbor. On 28 Oct. 1886, after more than 12 years of preparation, this statue, given by the people of France to the United States, was dedicated and unveiled. The statue was the conception of M. Bartholdi, who designed it for the Franco-American Union in 1874. It was built by popular subscriptions in France, and required over five years for its completion. It was mounted in Paris in October 1881. The American pedestal for the statue was not commenced till April 1883, and was finally finished in 1886. This was built by popular subscription. The statue was erected on an iron framework bolted firmly to the stone pedestal. The statue, which is of bronze, is of the following dimensions:

	Ft.	In.
Water-level to top of pedestal	149	10
Statue proper to top of torch	151	5
Total height from water-level	301	3
Heel to top of head	111	6
Length of hand	16	5
Index-finger	8	0
Circumference at second joint	7	6
Size of finger-nail	13 x 10 in.	
Head from chin to cranium	17	3
Head-thickness from ear to ear	10	0
Distance between the eyes	2	6
Length of nose	4	6
Right arm, length	42	0
Right arm, greatest thickness	12	0
Thickness of waist	35	0
Width of mouth	3	0
Tablet, length	23	7
Tablet, width	13	7
Tablet, thickness	2	0

The statue weighs 450,000 pounds, or 225 tons; the bronze alone weighs 200,000 pounds. Forty persons can stand comfortably in the head, and the torch will hold 12 people. The number of steps from the base of the foundation to the top of the torch is 403; from the ground to the top of the pedestal 195 steps. The number of steps in the statue from the pedestal to the head is 154, and the ladder leading up through the extended right arm to the torch has 54 rounds. The cost of the statue is estimated at $250,000; the cost of the pedestal and the erection of the statue $350,000; total cost of the work, completed $600,000. The light in the torch at the top of the Statue of Liberty is maintained by the Lighthouse Service of the government. Liberty exceeds in height the Colossus of Rhodes which was said to have been about 105 feet high. That of Nero is said by Suetonius to have been 120 feet high. The statue of Charles Borromeo, which is still standing on the Lake of Geneva, is 66 feet high, and is mounted on a pedestal measuring 46 feet. The celebrated statue of Jupiter carved by Phidias is said to have been 60 feet in height.

Liberty Tree, (1) a famous ballad of the Revolutionary War, written by Thomas Paine in 1775. (2) An old elm tree in Boston upon which the citizens hanged in effigy British officials connected with the Stamp Act and its enforcement.

Libi-divi, lē'bē-dē'vē. See DIVI-DIVI.

Libmanan, lĭb-mä-nän, or **Libanan,** lē-bä'-nän, Philippines, pueblo of the province of Ambos Camarines, Luzon, situated on the Polanluna River near its confluence with the Naga, 10 miles northwest of Nueva Cáceres. It is on the main road, and is a telegraph and military station. It has also important hemp and rice industries. Pop. 14,500.

Li'bra, (1) the ancient Roman pound weight, consisting of 12 ounces. (2) The original meaning is balance or pair of scales. (3) The seventh sign of the zodiac is called Libra, because at its first point the ecliptic crosses the equator to the southern hemisphere, and we have then the autumnal equinox, when day and night are, as it were, equally balanced.

Libraries, a general term used to designate collections of books and manuscripts for reading and preservation. The term library is also commonly applied to any apartment or building containing such a collection of books or manuscripts.

Libraries of the Ancients.—In early antiquity libraries consisted of archives, which were preserved in the sacred temples. The oldest library is said to have been founded in Memphis by the Egyptian king Osymandyas, of the 12th dynasty. It was housed in a division of the palace, at the entrance of which were inscribed the words: «The Healing of the Soul.» It contained works of an unknown antiquity deemed sacred by the Egyptians, which were destroyed in the ravages attending and following the Persian invasion. The monumental cuneiform records of the ancient Assyrian, Babylonian, and Persian empires have been designated «public libraries in clay.» The principal Hebrew library was in the temple at Jerusalem; it was restored after the captivity by Nehemiah, and again by Judas Maccabæus, and perished in the conquest by the Romans. In Greece, Pisistratus was, according to Aulus Gellius, the first to establish a public library at Athens. It was taken to Persia by Xerxes, returned by Seleucus Nicator, pillaged by Sylla, and restored by Hadrian. Polycrates soon after founded a library in Samos, and large collections of books were made by Euclid, Euripides, and especially by Aristotle, whose library, after passing through two generations, was purchased by Ptolemy Philadelphus and transported to Alexandria. Of ancient libraries, the most celebrated was that at Alexandria, which at one time is said to have contained 700,000 volumes. (See ALEXANDRIAN LIBRARY.) The first library at Rome was that of Paulus Æmilius (167 B.C.), the booty of war in Macedonia. Libraries subsequently became common, and in the time of Augustus it was fashionable for men of culture to have one in their houses. Sylla took from Athens to Rome the library of Apellicon the Teian; Lucullus made a large collection, and his galleries and porticoes became a favorite resort for conversation; Varro, Atticus, and Cicero were enthusiastic collectors of books. One of the unfulfilled projects of Cæsar was the formation of a public library, which should contain all the works in Greek and Latin literature. Augustus established the Octavian and Palatine public libraries, the latter of which continued until the time of Pope Gregory I. More important was the Ulpian library, founded by Trajan. In the 4th century Publius Victor mentions 28 public libraries in Rome, beside many valuable private collections. All of these perished in the storms of barbarian invasion. The library of Constantinople, founded by Constantine, and enlarged by Julian and the younger Theodosius to the number of 120,000 volumes, was partially burned by the iconoclasts in the 8th century under Leo the Isaurian. Libraries were founded from the 9th to the 11th century, especially by the imperial family of the Comneni, in the cloisters on the islands of the archipelago and on Mount Athos. After the fall of the Byzantine empire the imperial library was preserved by the command of Mohammed II. in one of the apartments of the seraglio, and was either destroyed by Amurath IV. or perished by neglect. The Moslems had an important library of Arabic books in Alexandria, and one at Bagdad, which included Greek manuscripts.

Mediæval Libraries.— As early as the 12th century Spain had upward of 70 libraries, and no monastery was founded without a collection of books, sacred and secular. The Benedictines had celebrated collections at Monte Casino, Canterbury, York, Bobbio, and Corbei. There were others at Fulda, Hirschau, Tours, Saint Germain des Prés, and Saint Gall. The revival of classical learning gave a new impulse to the formation of libraries. The large universities, princely families and many private scholars were zealous collectors. With the invention of printing began a new era in library history, the number of books being greatly increased and the cost materially reduced. Several of the largest libraries in Europe date from this period. The suppression of the numerous cloisters caused many small libraries to be incorporated in the larger collections of universities and cities. (See BOOK.) Nicholas V. during this mediæval period founded the library at the Vatican. Among others early founded was the Bodleian at Oxford (1597); the University at Cambridge (1475); the University at Edinburgh (1580); the Imperial at Paris (1377); the Town at Strasbourg (1531); the Royal at Munich (1550); the Royal at Copenhagen (1550); the Laurentian at Florence (1444); the Saint Mark's at Venice (1468); the University at Turin (1436); and the Town at Brussels (1350).

Libraries in Great Britain.—In Great Britain the two largest libraries of modern times are the Bodleian in Oxford, so named after its founder, the diplomatist and scholar, Sir Thomas Bodley (1545–1613), and now containing probably about 570,000 volumes and 30,000 MSS.; and the library of the British Museum at London, now one of the first in the world, and containing probably more than 1,900,000 printed books and perhaps 100,000 MSS. and charters. The library of Cambridge university is estimated at over 500,000 books and 6,500 MSS. Perhaps the fourth library in Britain in point of value is the Advocates' Library in Edinburgh, with about 350,000 books. The four Scottish universities have collections respectively of from 100,000 to 180,000 volumes. The most valuable library in Ireland is that of Trinity College, Dublin, with 240,000 volumes. Important free libraries have been established at Liverpool, Manchester, Birmingham, and Hull, which have each a library of over 100,000 volumes. These free libraries were the result of a Free Library Law passed by Parliament in 1850.

Modern European Libraries.—The principal libraries of modern times on the European continent are: the national library at Paris, about 2,600,000 printed books and 102,000 MSS.; the royal library at Munich, about 1,000,000 books and 40,000 MSS.; the royal library at Berlin, about 1,000,000 books and 30,000 MSS.; the imperial library at Saint Petersburg, with a total number of volumes about 1,100,000 and 28,000 MSS.; the Strasbourg University and public library, 760,000 volumes; the imperial library at Vienna, with more than 500,000 books and 24,000 MSS., and the university library with 559,000 books; the university library at Göttingen, having 500,000 books; the royal library at Dresden, 500,000 printed books and over 6,000 MSS.; Hamburg city library, 600,000 books and 5,000 MSS.; Leipsic University library, 500,000 books and 5,000 MSS.; the royal library at Copenhagen, now said to have more than 500,000 books and 20,000 MSS.; the royal library in Stockholm and the library of the University of Upsala, in Sweden (280,000 to 300,000 each); the national library in Madrid, 500,000 volumes; the royal library at Brussels, more than 375,000 books and 27,000 MSS.; the royal library at Stuttgart, 432,000 volumes; the Vatican library at Rome, with printed volumes estimated at over 200,000, and 26,000 MSS. Besides the national library, there are in Paris those of the Arsenal (454,000 printed books, 6,000 MSS.), of Saint Geneviève, of the Institute, and the Mazarin library (300,000). In the rest of France there are over 270 public libraries, the principal of which are those of Lyons (160,000 volumes), Bordeaux (200,000), Aix (170,000), etc. Access to these great collections is easily obtained both by natives and foreigners. In Italy there are a great number of valuable libraries, of which the university library at Bologna is said to contain 255,000 volumes, 6,000 MSS.; the National Library at Florence, 450,000 volumes, 15,000 MSS.; besides the Laurentian library in the same city, consisting almost entirely of MSS.; the university library at Genoa, 120,000 volumes; the Ambrosian at Milan, about 170,000 printed volumes and about 8,400 MSS.; the national library in the same city containing about 230,000 volumes; that at Parma 200,000 volumes, that of Naples 357,000, and that of Saint Mark at Venice 403,000. The Victor Emmanuel Library at Rome, consisting of the old library of the Jesuits, augmented by the libraries of suppressed monasteries, has over 550,000 volumes; the Casanata library, also at Rome, is said to contain 160,000 volumes, the Biblioteca Angelica 150,000 volumes, the Barberini library 100,000. The French government in the 19th century established over 25,000 popular libraries in connection with primary schools.

Libraries in America.—Soon after the Puritans landed at Plymouth Rock they founded a college and with it a library. The Harvard College Library established in 1638 was followed by Yale and William and Mary in 1700. The Philadelphia Library was founded in 1731, that of the American Philosophical Society (q.v.) (1742); the Charleston, S. C., Library (1748); the Athenæum at Providence (1753); the Society Library in New York (1754); New York Historical (1804); and the Boston Athenæum (1804). In 1800 the Harvard College Library had only 12,000 volumes; the largest, the Philadelphia Library Company, after absorbing three similar libraries, had only 18,391; the New York Society Library had 5,000; Yale College had only 2,700; and the Charleston Society Library had reached 7,000. These were the giants; no other library had 2,500; not half a dozen had 1,000; the average was 500 volumes.

A new era in American library history began in 1833, when a Unitarian clergyman at Peterborough, N. H., founded a free circulating library by an appropriation that has been continued annually to this day. Thus America became the birthplace of the free library, for the leaders of the movement which resulted in the Free Library Law of 1850 in England have said that they derived the idea from this country. In 1847 another small town, Orange, Mass., opened a free library, and four years later Wayland, Mass., followed. Then came the passage of the acts by which New Hampshire in 1849, and Massachusetts in 1851, authorized any town to tax itself for a free public library. In 1835, a law of New York permitted each school district to tax itself $20 to found, and $10 a year to maintain, a free public library. But as the people would not tax themselves, the friends of the measure persuaded the Legislature in 1838 to appropriate $55,000 a year to purchase the books. Fifteen years later the libraries had over 1,600,000 volumes, but they were very little used, except in the cities, and the system was an entire failure.

Meanwhile other great libraries were being established in the larger cities. The New York Mercantile was founded in 1820; the Astor (q.v.) in 1839, and the New York State at Albany in 1818. Others established were the State at Annapolis, Md. (1826); the State at Indianapolis (1825); the Boston Public, (1852); the Congressional, at Washington (1851), and the Smithsonian, at Washington (1849). Until 1876 these institutions and the smaller libraries worked along individual lines with no thought of organized effort, or of comparing views or adopting common plans for library improvement. But in 1876 the American Library Association was formed and the publication of the 'Library Journal' commenced. Since that date development in Library Science has been rapid, there being five divisions in which there has been the most progress — library establishment, the profession, the building, the management, and the methods of reaching the public. The trend of opinion has been toward libraries established by legislation, supported by taxation, helped as far as possible by private generosity, managed by their own authorities, free to all, the library of the people, by the people, for the people. To assist their establishment, 17 State library commissions were organized, the first in Massachusetts in 1890.

The gifts to libraries by private individuals between the years 1893 and 1903, originating, perhaps, in the persistent solicitation of college presidents, have been remarkably generous, the total amounting to many millions of dollars. Most of these donors, however, have preferred to give buildings and land rather than books, or funds for buying books. (See CARNEGIE, ANDREW.) The growth and development of the Boston and Chicago public libraries; the wonderful progress of the Congressional Library (q.v.) at Washington and the consolidation of the Astor (q.v.) and Lenox (q.v.) libraries and the Tilden Foundation into the great New York Public Library (q.v.), are the chief events in the library history of the present day.

Libraries, Traveling. See TRAVELING AND PICTURE LIBRARIES.

Library Administration. In recent years the conception of a library's field and functions has grown so rapidly that library administration has become a recognized science with problems vastly broader and deeper and demanding well equipped professional schools giving systematic instruction to those in whose charge the leading libraries will be placed.

This has greatly altered the librarian's status. Once he was little better than a head janitor whose functions were to keep the books clean and protected. Now the New York State library school, the first of its kind in the world, admits no candidate to its two years' course who is not a college graduate and in addition gives promise of more than ordinary success. In salaries, hours of service and vacations the librarian is rapidly winning his place beside other educational officers, as the public recognizes that in general education, professional training, executive capacity and all the factors which determine salary, the successful modern librarian takes full rank with the highest educational officer of the same community. The proper salary of a college librarian is now that of a full professor. In a university he ranks with deans of departments and in public libraries with superintendents of schools or high school principals. Usual daily hours are now 7 and usual vacation one month, with a growing tendency to allow a second month for illness or other absences, so that a librarian who has lost no time during the year will have two months for a long summer vacation, or somewhat over half what is enjoyed by most teachers.

Functions.— The chief function of the old library was to get all the books it could and preserve them safely. The modern library does this also, but has placed free public use infinitely above getting and keeping. First the word library lost its etymologic meaning from the tree bark on which writing was done, and came to mean any collection of books. It is now rapidly losing that sense and means the community intellectual headquarters where are to be found not only books and pamphlets, but periodicals, newspapers, maps, pictures, coins, medals and collections illustrating science, history or art. It is no longer a reservoir whose chief function is to take in and accumulate, but a fountain. Its work is no longer passive, but aggressive. The modern librarian is as anxious to put his wares before the public and have his books and other material used as is the store or factory to secure custom for its goods.

We have learned that reading is the greatest engine human genius has evolved. It grows constantly in importance. While most reading is better than most conversation, it is as powerful for evil as good, so that the greatest problem for educators and statesmen is to develop in youth a taste for the best reading and to supply it free through life.

Reading has three great functions: (1) To inform, so that one may stand on the shoulders of all his predecessors and utilize their labors and experience in any subject. This cumulative wisdom of the race passed on in books makes possible the marvels of civilization. Books give this information which builds material prosperity. (2) A still more vital function, but less tangible, is the inspiration which lifts up and builds character, the work of the books of power, the books of all time. (3) The last great function is to afford rest and recreation for the tired and overworked to fit them better to carry life's burdens. The free public library has been found the only practicable method for shaping this reading, which in its threefold form of information, inspiration and recreation is the greatest influence in modern life.

Administration.— Books and other suitable material are no more a library than a pile of bricks is a building, or a mob of men is an army. To be effective there must be such arrangement and organization that its great functions can be performed promptly and efficiently without undue cost. Experience proves that the chief factors in a successful library are in order of importance: (1) Librarian; (2) books; (3) methods; (4) building. Because it is most prominent and readily understood by the inexperienced, the least important is usually thought of first.

Library Buildings.— To compete successfully with places of amusement the library should be as accessible as possible, but preferably a few steps off the main street for greater quiet. Books increase in a ratio beyond the plans of architects and librarians, and not one library in a hundred makes sufficient provision for growth, either for books, readers, or administration. Good natural light and ample room for growth are essential. Steel, glass and brick are the best materials for large libraries, but fireproof construction is important only for central libraries which preserve rare books not readily obtainable in open market. The best books should be housed within easy walking distance of every citizen. This requires in larger towns branches or deliveries at convenient points. The most used books should be freely accessible in reading-rooms, but economy and convenience both demand that the main supply should be kept in stacks. The best standard type is made up of double-faced bookcases only 75 cm. apart, thus filling solidly with volumes all space not needed for access to them. Each case is eight shelves high and five tiers long, thus giving 80 shelves on its two faces. Each shelf is 75 cm. long, 20 cm. deep and 25.5 cm. high, thus taking all books up to the largest standard (8vo) which by library rules is limited to 25 cm. These cases make a one-story stack, with every book within reach of the hand without ladders. Wood is used for one or two stories, but steel is better for the taller stacks (sometimes 10 stories) and grows steadily in favor because it is strong, compact, fireproof and more open for light. The simplest satisfactory fireproof construction costs from 15 cents to 30 cents per volume of storage capacity. The plainest oak shelving can be built for about four cents a volume, while for temporary use the cheapest packing-boxes in four-shelf units 75 cm. long, each holding 100 volumes, can be made for 50 cents, the cheapest possible temporary storage.

Hot water heat is best. The boiler costs the same as steam, piping and radiation about 25 per cent more, fuel a trifle less. But steam is a less pleasant heat and is very apt to crack and annoy readers.

Artificial light should be provided on all reading-tables. High lights are bad for the eyes and unnecessary except for occasional illuminations. Acetylene gives a more perfect light, but the convenience of carrying flexible wires and turning on and off with a touch makes electricity almost the universal light where current can be bought cheaply. The stack section of the building should be of glass with only steel or masonry enough for support, with glass always opposite aisles.

Spiral stairs are costly, wasteful and inconvenient. Straight stairs under which space can be used for shelves take less space. Doors to bookcases are worse than useless and have been abandoned except for rare, costly or restricted books. Tables and desks should be 78 cm. high, not 75 cm. as usual; for short people can use higher chairs, but tall people cannot shorten their legs. Skilful arrangement of rooms will greatly reduce cost of administration. Permanent partitions should be used only where necessary for support. Temporary partitions, usually glass, can be readily moved as growth requires. These allow better light and supervision from another room, while shutting off noise, and give a more spacious look. Most important after the central rooms are: first a quiet study room, then a children's room. Even small libraries need one or more class or lecture rooms for clubs, classes and meetings which find their natural home at the library. Larger libraries require a growing number of special rooms for newspapers, art, patents and various other needs of the staff and public.

Selection of Books.— Counting only the prominent nations, a new book is published every five minutes to swell the millions previously printed. Unbound books or pamphlets are almost beyond number. Besides the almost incredible number of daily, weekly, monthly and other periodicals, there are as many more institutions and societies constantly publishing papers, transactions and reports. Large libraries must make a liberal selection from these, complete, bind and preserve them for the use of posterity. The New York State Library alone receives 12,800 of these sequents. As every library is limited for money and space, it is a grave problem just what to buy and, except in cyclopædic libraries that take everything, what to accept as gifts. The need of printed guides has been partly met by bibliographies, catalogues and lists to help determine quickly what is best to buy, its cost, where and by whom published, and perhaps to track it through auctions and stores. Many think of these bibliographies as constituting a dozen or so reference books, but a reasonably complete collection numbers over 20,000 volumes and is growing as rapidly as other subjects. It is one great factor in the professional training of a librarian to learn how to use this extensive apparatus successfully.

Accessions.— After a book is selected, it must be made part of the completely organized library which has as its ideal the choice and delivery to each inquirer, with the least possible delay, of the book, pamphlet, article, essay or other item which then, there and to him will be most useful. This is a most difficult problem even in a small library, and in large ones with a million or more items from which to choose, no satisfactory results can be reached without an elaborately organized system, administered as carefully as are the details of a great factory or railway, where mistakes and carelessness are intolerable. There are 30 distinct steps in the accession department routine alone of a large library before a book is ready to be classified or catalogued. Economists have repeatedly tried to shorten the processes, but after a few years experience have been forced to incur the extra cost of going back and supplying omissions as the only way to avoid a more serious expense in the delays of hourly service to readers. Ownership is marked by a bookplate inside the front cover with name of library and official marks. The name is also repeated (stamped, embossed or preferably perforated) on the title-page so that it cannot be removed by book thieves, and most libraries have private marks at some special page, to be found only by one knowing the key, as a means of identifying lost or stolen books. Book numbers gilded on the back insure quick finding and replacing on shelves, and lending libraries usually put a manila pocket inside the back cover to carry the book or reader's card. The accession book is the business record. Every volume has a line across the two pages as its pigeonhole for its complete history. The columns are: number (in order of receipt), class number (showing subject), book number (showing place in that subject), volume number (if more than one), author, title, place and publisher. year when published, number of pages, size, binding, source (name of giver or seller), cost, with a final wide column for remarks on the book's history. for example, lost, worn out, sold, or withdrawn.

The accession number is stamped on first recto after title, on shelf list and cards, and exactly identifies that particular volume.

The shelf list is an inventory or brief list of all the library contains by subjects, and is usually kept on sheets laced in a binder, one sheet to each subject. Besides class, book, accession and volume numbers, it gives merely author and short title. It is used to take the annual inventory and is also a convenient form of subject catalogue, though it gives no cross references.

Author Catalogue.— This like all other catalogues and indexes is kept on cards 7.5 cm. high and 12.5 cm. long, the size adopted for national and international use and rapidly displacing all other sizes except for peculiar uses. (See LITERARY LABOR SAVERS, *Card Index System.*) The author catalogue gives under each name all of any author's work which the library has, without including any done by some one with the same initials or full name, thus confusing identity. This author catalogue is often expanded to include striking titles of anonymous books, names of subjects of biographies, criticisms and reviews, or any topic for which the subject entry would be the name of a person or place. It is then called the «name» catalogue.

Subject Catalogue.— This shows what the library contains on any given subjects. For lack of time or money it records in many libraries only books, but a complete catalogue would add pamphlets, articles in periodicals, papers, transactions, essays and collected works, maps and whatever material one studying that topic might want. The Decimal classification, now generally used by libraries, has over 20,000 subject headings and many new ones are added yearly. By means of its very full and simple index, any one who knows what a book is about may readily classify it minutely; the youngest assistant knowing clearly what subject he seeks may find it with equal ease.

The most common form of catalogue extends the name list to include any subject on which the library has a book. A catalogue with authors, titles and subjects in a single alphabet, with cross references from various synonyms so that one consults it like a dictionary, is called a dictionary catalogue. The author catalogue corresponds to the personal list in a directory; the classed catalogue to the business section showing who is engaged in each specific line of business. A dictionary catalogue requires the least explanation and is most popular, but it is more difficult to make well, and except at prohibitive cost cannot give intelligent investigators as clear and methodic exhibits of a library's resources as may be found in the best classed catalogues. Larger libraries have many special catalogues, bibliographies and indexes as keys to their own special collections.

Annotation or evaluation is a most important factor in modern cataloguing. Its purpose is to tell in fewest words what readers are most likely to wish to know about a book as to its scope, treatment and value. The American Library Association publishing board, to which Andrew Carnegie recently made a first gift of $100,000, is publishing numerous lists on this plan. The New York State Library is preparing with the co-operation of nearly 300 prominent librarians and specialists the annotated A. L. A. catalogue which the national library will publish for the St. Louis exposition of 1904. New editions constantly revised and with more notes will follow, so that both librarians and readers will have a guide to 8,000 or 10,000 of such of the best books still in print as would be selected as a model library for a small town.

Lending.— A loan system must give the quickest possible service consistent with accurate and complete records. In America the card system is found better than the indicators so largely used in England. The librarian must know where every book is, when it should be returned and must be able to find daily those that are delinquent. Extra privileges in number of books or time retained are given to scholars having special claim, and many libraries allow two books instead of one provided that only one is fiction. Inter-library loans are frequent so that a reader in one library may, when necessary, secure a book to be found only in some other.

Libraries grow more liberal in privileges to readers who now find a large number of the most used books on open shelves instead of having to ask for each book consulted. In many libraries not only so called reference books but thousands of other volumes are thus thrown open to the public. Losses are not large compared with benefits, and the system grows in favor. The recently novel information bureau or reference desk in charge of an expert librarian whose sole function is to answer readers' questions has become a common feature, while the larger libraries are establishing a library faculty, each member taking some special subject on which he will be a recognized authority. Special rooms are set apart for important subjects, each in charge of a specialist. Even the smallest libraries are providing a children's room with low chairs and tables and a sympathetic librarian devoted wholly to their interests. Experience proves that time and money yield larger returns when spent on children than on adults. The children's room becomes the best possible training school for supplying readers who will use the library properly. Rooms for women's exclusive use are little used, women apparently seeing no more occasion for separate provision than in churches, lecture halls or theatres.

Support of libraries by fees is giving way to support by taxation, as a fee is prohibitive to many, and communities are coming to recognize that it is as much for their interests to have the «people's university» as the public schools free to all. Hours of opening have been lengthened from two or three a day till the larger libraries usually open from 8 A.M. to 10 P.M. and no longer close for evenings, holidays, vacations or the annual inventory of books. Sunday opening has proved unexpectedly successful. The theory of the modern library is to be available to readers at any time when they are inclined to use its privileges.

Paid Help.— A highly appreciated accommodation, offered by the New York State and some other libraries, is assistance of an extent or nature not properly provided at public charge, for mere cost of the time spent, estimated at the rate of annual salary. This saves people at a distance costly journeys, because an expert trained in a given library can often find as much in an hour as the reader himself would find in a whole day. The telegraph or long distance telephone makes the central cyclopædic libraries quickly available for large areas, and editors, lawyers and others whose time is specially valuable may get needed information, and if wished translations, verified copies or any library service needed quickly at the trifling cost of the time of the lowest salaried assistant competent to do the work.

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Library Buildings. See LIBRARY ADMINISTRATION.

Library Schools. With the advance of the free library movement and the growing complexity of the functions and organization of the modern library, the need has been increasingly felt for specially trained librarians. The first library school was organized in 1887 as a department of the work of Columbia College, under the charge of Melvil Dewey, and has since become the New York State Library School. At that time the course consisted almost entirely of instruction in the more technical work of library administration, but since then the ideals and scope of library schools have broadened, and they aim to give their students not only technical courses, but such courses as will enable them to deal with the public successfully, and become a real educational force in the community where they may be placed. The course in library schools usually includes cataloguing, bibliography, shelf-listing and accession work, library building, instruction in printing and book-making, reference and loan work, and general library economy; some schools provide, in addition, courses in history of libraries, and «selection of books»— that is, the critical study of books with a view to determining their fitness for use in different kinds of libraries and with different types of readers. As there are few text-books, the instruction is mostly by lectures and the students' working out problems, preparing sample catalogues, accession books, etc.; all the schools have also some provision for actual work in a library. Instruction is given in different systems of cataloguing, loaning of books, and other technical work, and both the more complex systems suited for large libraries, and the more simple systems for small libraries are taught; sample blanks, forms, and fittings for all departments are used to illustrate the different methods.

Individual Schools.—The first library school was the New York State Library School, founded as has already been mentioned in connection with Columbia College (now Columbia University). In 1889 when Mr. Dewey, its director, was appointed State librarian, the school was moved to Albany and became a part of the University of the State of New York. Its curriculum has gradually been enlarged, and its entrance requirements raised until in 1903 it was decided to require a full college course for entrance to the school; the degree of B. L. S. (bachelor of library science), which was at one time given only to those who had attained a certain rank throughout the course, is now given to all graduates who do the full work of the school; a carefully prepared bibliography or reading list on some approved subject is required, in addition to the class and practice work, for this degree. The practice work is provided for in the State library, and the traveling library and home education department. The Pratt Institute Library School was opened in 1890; entrance is by examination only; the main course is for one year, but a second independent course of one year is given in advanced work; separate certificates are given to show completion of work in each course; and those students who complete the two years' work can take the diploma of the Institute by passing the Institute's normal examinations. Practice work is required in the Institute library, and may also be had in various settlement libraries and home library work; in 1903 the experiment was tried of having the incoming class do two weeks' practice work in the library before the regular instruction was begun; this proved successful and will be continued. The Drexel Institute Library School was opened in 1892; entrance to this school is by examination, and a certificate is given on completion of the course. The Illinois State Library School was opened in 1893 at the Armour Institute of Technology, and in 1897 became a part of the State University. The library course proper is two years, before which three years' collegiate work is required; previous to 1903 only two years' collegiate work was required. For the completion of the three years' collegiate and two years' library work, the degree of B. L. S. is given; for three years' collegiate and one year's library work, the degree of A. B. in library science. In addition to the regular library school courses, a special course in the care of public documents is given. Practice work is provided for in the University Library, and in the Champaign Public Library, a branch of the latter being entirely under the charge of the students of the library school. Since the establishment of these four more important schools, library school departments have been added to several universities and colleges. Among these are Department in Library Science in Chicago University, the course in Library Economics in Syracuse University, the School of Library Science in Columbian University, Washington, and the course in Library Science of Simmons College, Boston. Of these the Chicago department requires two years of college work for entrance; Syracuse admits on high school diploma. The Simmons College course (started in 1902) extends over two years, the library school work being done in connection with work in other departments of the college; a third year of advanced work is given to those who have completed their college work and can give their full time to the technical library work. The college library is under the charge of the library school students.

One other school, devoted to a special line of work, should be mentioned, the Training School for Children's Librarians at the Carnegie Library of Pittsburg. This was started in 1900 as a training class of the library; entrance is by examination or by college diploma, and a certificate is given at the completion of the work. One half the time is given to practice work in the children's room of the library.

Summer Schools.—A number of library summer schools have been organized, mainly with the idea of giving training to those who already hold library positions, or have been appointed to such positions. The instruction is, of course, not so thorough as in the regular library school, but is entirely practical; the courses usually cover the whole range of library science in a general way, and in most summer schools special courses are also given in one or two technical subjects. Among these schools are the Amherst summer school, the Chautauqua school, the New York State Library summer school, the summer library courses of the universities of Missouri and Wisconsin, and the summer schools under the charge of the State library commissions of Indiana, Iowa, and Minnesota.

Besides these schools, many libraries have apprentice classes, designed mainly for instructing and training assistants for such libraries; but a general letter of recommendation to all libraries is in many cases given the graduates of these apprentice classes. Of the larger libraries to have such classes are the public libraries of Providence, R. I., Brooklyn, New York City, Madison, Wis., and Nashville, Tenn. Lately also several colleges have introduced courses in bibliography and the history of printing, and some normal schools have similar courses, including something also of general library economy. This is not with the purpose of training the students to become librarians, but with the idea of enabling them to make the best use of the resources of the library, and, in the case of normal graduates, to enable them to organize school libraries and co-operate intelligently with the public library work.

Consult: The catalogues and reports of the individual schools; ‘The Library Journal,’ for July, 1898 (Conference number), and for July, 1903 (Conference number).

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Editorial Staff, ‘Encyclopedia Americana.’

Library of Congress, The. See CONGRESS, LIBRARY OF, WASHINGTON, D. C.

Libra'tion, in astronomy, an apparent oscillatory motion of the moon, which causes parts near the edge to appear and disappear from time to time. It was discovered by Galileo. If the moon moved round the earth with a uniform angular velocity equal to its angular velocity of rotation on its axis, and if its axis were at right angles to its orbit, the same side of it would always be presented to the earth, and we should see only one-half of its surface; its libration enables us to see about 4-7ths of its surface. The moon's orbital angular velocity is sometimes slightly greater and sometimes slightly less than its axial angular velocity, hence equatorial parts of the moon near the edge are sometimes visible and sometimes out of sight. There is also a very small diurnal libration due to the motion of an observer on the earth.

Libri Caroli'ni. See CAROLINE BOOKS.

Libri-Carrucci della Sommaia, Guillaume Brutus Icile Timoléon, gē-yōm broo-tüs ē-sēl tē-mō-lā-ŏṅ lē'brē kä-roo'chē dĕl'lä sŏm-mä'-yä, COUNT, French mathematician: b. Florence, Italy, 2 Jan. 1803; d. near Fiesole, Italy, 28 Sept. 1869. His father was an Italian adventurer, in 1816 condemned at Lyons to ten years' imprisonment at hard labor and to branding for counterfeiting goods, and who finally became a secret agent of the king of the Netherlands. The son became professor at the University of Pisa, where he published in the scientific journals several articles on the theory of numbers, on analysis, and the resolution of indeterminate equations of the first degree. Having been compromised by his political views, he fled in 1830 to France, where the friendship of Arago introduced him to the world of science. Naturalized in 1833 as a Frenchman he was called to the Academy of Sciences as successor of Legendre. He became inspector-general of public instruction, obtained the cross of the Legion of Honor, and was appointed inspector-general of the libraries of France, an office created expressly for him. Several works published by him during this period gave him a widely extended reputation. Among these were ‘Histoire des Sciences Mathématiques en Italie depuis la Renaissance jusqu'à la Fin du 17e Siècle’ (1838–41); ‘Souvenirs de la Jeunesse de Napoléon’ (1842); and ‘Lettres sur le Clergé et la Liberté de l'Enseignement’ (1844). During the latter part of the reign of Louis Philippe, he was suspected of having made use of his office of inspector-general of libraries to plunder them extensively. After the minutest investigation, Libri, who had escaped to London, was found guilty and condemned in June 1850, to ten years' imprisonment and degradation from public employment. A remarkable paper was written on his behalf by Paul Mérimée entitled ‘Le procès Libri,’ and published in 1852 in the ‘Revue des Deux Mondes.’

Liburnia, lī-bėr'nĭ-ạ, in ancient geography, a district of Illyricum along the coast of the Adriatic, now included partly in Croatia and partly in Dalmatia. The country is mountainous, and the inhabitants were celebrated from early times as sailors. They occupied the northern islands of the Adriatic, and had settlements on the Italian coast. Their chief towns were Scardona and Iader.

Libya, lĭb'ĭ-ạ, the geographical term of the ancients for Africa. At first it had mythical boundaries. Though Herodotus seems to have known that Africa was a peninsula, the moderns knew little about this till the Portuguese doubled the Cape of Good Hope in 1497. Homer and Hesiod comprised under Libya all the territory west of Middle and Lower Egypt. The Macedonian kings of Egypt, on the development of commerce, necessarily acquired a more exact knowledge and the wars of Rome with Carthage first gave men accurate knowledge of the interior. The sandy tract in which the Sahara is included was called the Libyan Desert and that portion of the Mediterranean extending between the coast of Africa and Crete was known as the Libyan Sea. See AFRICA.

Lich Owl, or **Litch Owl** (Germ. *leich,* a corpse, O. E., *lich* or *lych,* dead), a provincial British name for any owl, which screams at night, and is superstitiously regarded as portending death. From the earliest ages the hoot of the owl has been regarded as ominous. Ovid, Virgil, and Shakespeare contain many illustrations of this common superstition. See LYCHGATE.

Lichens, lī-kĕnz or lĭch'ĕnz (Lat. *lichen*, lichen, Gr. λειχήν), a large but artificial group of the higher fungi (*Carpophyta*), characterized by parasitic growth upon the lower blue-green and yellow-green algae (*Protophyta, Chlorophyceæ*). Lichens are of the widest occurrence in nature, appearing as gray, yellow, and brown crusts or masses almost everywhere upon trees, rocks and soil. The number of genera and species differs more or less with the authority cited: the valid genera number not far from 250, while the species are in the neighborhood of 4,000.

The vegetative body or thallus varies from a fraction of a millimetre to several decimetres in size, though it shows relatively little variation in thickness. In texture it is powdery, leathery, paper-like, or, in the case of many forms with blue-green algæ, gelatinous: the prevailing colors are gray, brown and yellow, while green and black sometimes occur. The shape of the thallus is typically orbicular or stellate; it is often irregular, especially in branched forms. In general appearance, the thallus varies within wide limits; as a rule, however, three types, crustose, foliose and fruticose, may be clearly distinguished. The crustose type is the primitive one, showing in its granular, warty, and areolate forms the various stages through which the thallus has passed in its development from the original mycelium. The crustose thallus is so closely in contact with its substratum that it cannot be separated from it without tearing. The foliose type is a higher development of the crustose. It is usually a definite, leaf-like structure, more or less lobed at the margin and attached to the stratum somewhat loosely or at but a single point. The fruticose type is a special modification of the foliose, in which the latter is more or less flattened or cylindrical and erect or pendulous. This form is probably an adjustment to conditions of diffuse light. It is especially characteristic of tree-lichens, and of certain ground forms, such as *Cladonia*, where it is termed the podetium. In the latter, there is also developed an accessory or secondary thallus, consisting of minute, leaf-like scales.

The simplest thallus consists merely of a few fungus threads enclosing the irregularly disposed cells of the host or alga. Ordinarily, however, the algal cells not only have a definite position, but the fungal portion of the thallus is likewise highly specialized. Naturally, this differentiation is least in the crustose forms and greatest in the fruticose ones. The structure of the foliose type may be taken as fairly representative, except of the gelatinous lichens, in which the algæ are scattered throughout the thallus. A definite epidermal layer is wanting except in a few of the higher lichens, where the outer filaments have been gelatinized, resulting in the formation of a structure closely resembling a cuticle. As a rule, however, the uppermost part of the thallus is the cortical layer. This consists of hyphæ (filaments) compacted in such a way as to produce a tissue which looks much like parenchyma and is called in consequence, pseudoparenchyma. The function of the cortical layer is in part mechanical or supportive and in part protective. Its structure seems to depend primarily upon the latter function: it is least in those forms growing in forests, and greatest in those found in the open. Below the cortical layer and continuous with it is found the host or algal layer, consisting of filaments more or less loosely intertwined with the algæ. This is the nutritive layer, in which the fungal hyphæ draw their nourishment from the host-cells. The connection between the two may be merely by contact or by penetration. In the latter case the fungal hyphæ either penetrate the protoplasm of the host and finally destroy it, or merely pierce the cell-membrane and lie in contact with the protoplasm. In either event, the hyphæ develop special branches for contact or penetration, which are called haustoria. The algal layer is a specialized portion of the medulla which lies just below it. The hyphæ of the two layers are continuous, but they do not develop haustoria in the medulla, where they tend also to run more or less parallel with the direction of growth. The medullary layer primarily serves the function of transport; it is likewise used for the storage of lichenin (lichen-starch) and fats. The lower surface of the thallus is covered with a cortical layer similar in structure to that of the upper surface. Generally, however, it is somewhat thinner and is designed rather for absorption than for protection. It is frequently produced into fascicles of hyphæ termed rhizoids and cilia.

The thallus of many lichens exhibits several peculiar structures, which are the direct result of the symbiosis of fungus and alga. The most frequent and most important of these is the soredium. This is a minute irregular mass of fungal hyphæ and algal cells, readily carried by wind or water, and able to grow directly into a lichen thallus under the proper conditions of moisture and warmth. Soredia occur upon the upper face of the thallus of many lichens as elevated powdery masses or tubercles. They arise in the algal layer of the thallus by the repeated branching of a fungal filament in such fashion as to completely enclose one or more cells of the alga, which also increase in number. The hyphæ become more or less gelatinized and compacted into a surface very resistant to desiccation. The soredia are pushed upward through the thallus by the growth of the filaments below, and are finally extruded through a rift in the cortical layer, constituting a sorus. Normally, the soredia are carried away from the sorus and develop independently, but in some cases they grow while still in contact with the mother-thallus, producing minute, leaf-like scales upon the latter. These are the so-called isidioid growths or phylloclades, found in *Usnea* and related genera. Soralia are structures which arise from the medulla or even from the lowermost layer by the upgrowth of a mass of parallel filaments which penetrate the algal layer and there develop into normal soredia. Cephalodia bear the general appearance of soredia. but in origin and function they are quite different. They are distinguished as external, and internal. The cause of their development is unknown:

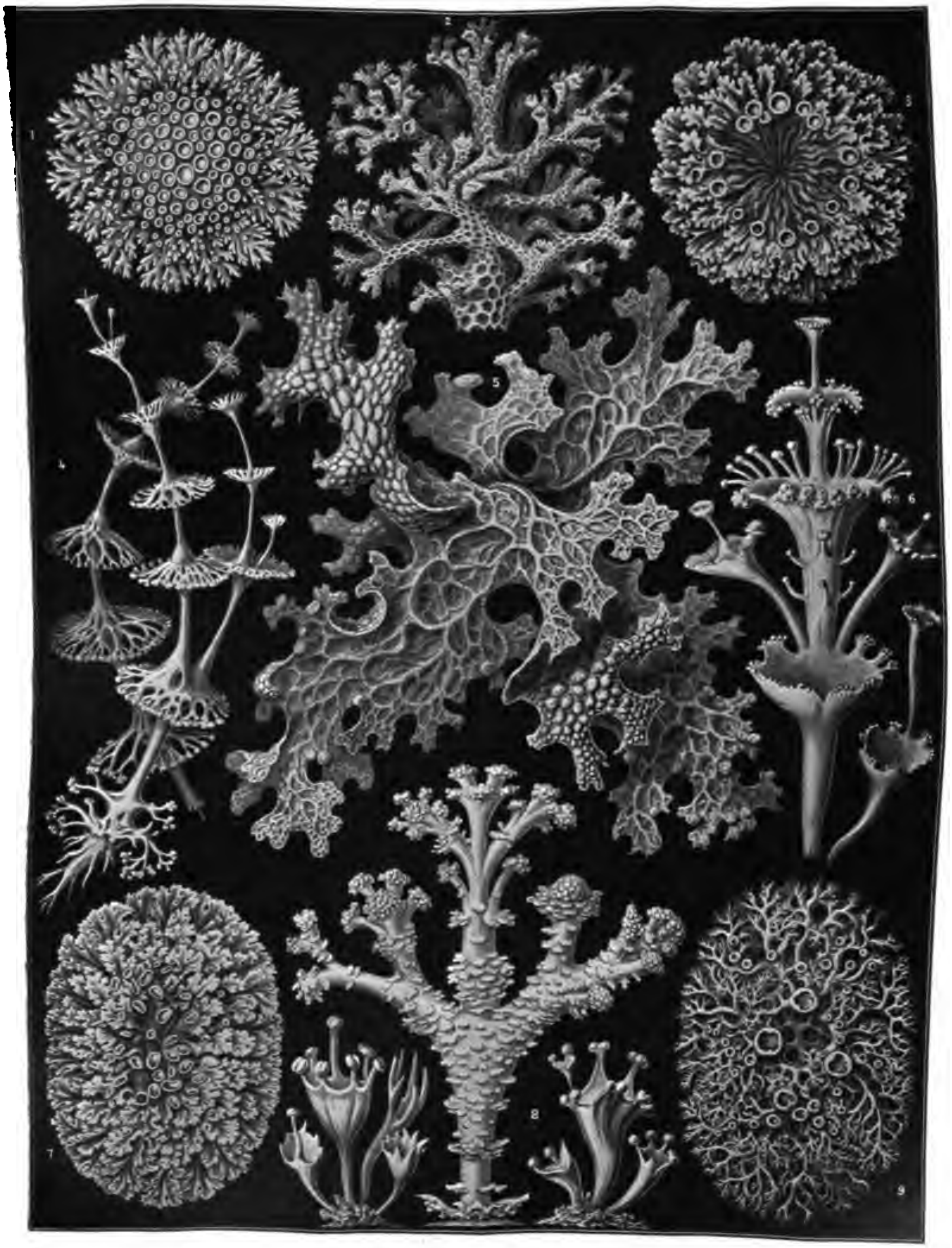
they are said to arise from the soredia of other lichens, which have lodged upon the thallus. They have never been produced experimentally, however, and it seems much more probable that they are modifications of the thallus due to a change in the life form of the algal element. The cyphellæ are flat or concave gaps in the lower cortical layer of the thallus of *Sticta* and *Stictina.* They are filled with variously branched hyphæ of the medullary layer and probably function as organs of absorption and respiration. The spermagonia are minute black dots occurring on the upper face of many lichens, especially near the margin of the thallus. Structurally they are identical with those propagative organs of black fungi that are termed pycnidia. They are spherical bodies with a membranous or carbonaceous envelope, containing a layer of rod-like filaments which bear at their tips tiny spore-like bodies called spermatia. As the names indicate, the spermagonia were supposed to be male reproductive organs, and the spermatia the fertilizing cells. There now seems to be little doubt, however, that they are propagative organs or pycnidia inherited from fungus ancestors. In a few cases they may be pycnidial parasites, such as *Phyllosticta.*

The fruit (sporocarp) of those lichens which bear spore-sacs (ascolichens) is called a perithecium when the fungus is one of the black fungi (*Pyrenomycetales*), a hysterothecium, when it belongs to the cleft fungi (*Hysteriales*), and an apothecium when the lichen is a cup fungus (*Discomycetales*). All these agree essentially in structure, though they differ in form: the perithecium is globoid, opening by a minute pore at the top, the hysterothecium, linear or irregular, opening by a cleft, and the apothecium usually open and disk-shaped. The essential parts in each are the same, namely; spore-sacs (asci), the spores, and the sterile threads (paraphyses). The apothecium is the highest type of spore-fruit and the most widely distributed. It consists usually of the following parts: the thecium, the central portion consisting of the asci, sometimes called thekes, and the paraphyses; the epithecium, which lies above the asci; and the hypothecium which is found below them. The latter often extends around the sides of the thecium also, and is there termed the exciple (proper exciple, parathecium). All of these consist of densely compacted elongate hyphæ (prosenchyma) which are without algæ and are often more or less dark colored. In most of the higher lichens, the exciple is surrounded by the tissue of the algal layer, producing a thalline margin (thalline exciple) about the apothecium. The apothecium usually sits directly upon the thallus; occasionally it is stalked, and less frequently it is immersed or innate. Lichens show the same differences with respect to paraphyses, asci and spores that are to be found among the other cup-fungi and black fungi. The paraphyses are simple or repeatedly branched, continuous or septate, gelatinized or non-gelatinized, persistent or evanescent. They are often compacted and dark-colored at the tip, appearing to be continuous with the epithecium. The spore-sacs of lichens are cylindrical or clavate in form, more rarely obovoid. Their walls are thin, though sometimes gelatinized; they do not react to iodine as a rule, except when very young. The asci usually open by a terminal slit; in a few cases the entire wall breaks away. The number of spores in an ascus varies from one (*Pertusaria*) to many (*Acarospora*); the normal number is eight, six or four. The arrangement of the spores is usually irregular, though they are sometimes in one row (monostichous), or in two rows (distichous). Lichen spores are ordinarily colorless and simple, less frequently dark brown and many-celled. They may be two-celled (bilocular), several-celled (plurilocular), or muriform, when the partitions run in both directions. The wall of the spore is smooth and without appendages; the contents may be hyaline, granular or guttulate.

Physiology and Reproduction.—The functions of lichens are essentially those involved in the relation between parasite and host, modified to an important degree in those forms with well-developed thallus. Absorption of water takes place readily upon both surfaces of the thallus, but especially on the under side, where hyphæ, cilia and rhizoids all act more or less efficiently as absorptive agents. According to Zukal, the hyphal hairs are capable also of absorbing moisture directly from the air, in *Physcia, Peltigera, Sticta,* etc. Water-storage takes place in the algal and medullary layers. It is effected primarily by the algal membranes, especially of the blue-green slimes, and to a degree also by the lichenin of the hyphæ. Zukal has suggested that the cephalodia, because of their blue-green algæ, are probably to be regarded as structures for the storage of water. The ability of the lichen thallus to retain water arises from its complexity, and from the presence of the gelatinized cortex. Lichens exhibit a number of somewhat primitive devices for the exchange of gases. These are often mere rifts in the thallus, or degenerate pycnidia; sometimes definite openings are present, or absorption takes place through loose protuberances. A specialized organ for this purpose is found in the cyphellæ of *Sticta* and *Stictina,* which are primitive breathing pores, making direct connection between the air and the medullary layer. The latter serves as a pathway for the transport of water and gases to the various parts of the thallus.

The relation of the lichen thallus to the environment is obscure. Of all macroscopic plants, lichens resist drying-out the most successfully. With respect to the temperature extremes which they can endure, they are surpassed only by the bacteria. Many lichens withstand temperatures greater than 65° C., and nearly all are able to resist the intense cold of arctic and alpine winters, with minima of —40° to —60° C. Lichens exhibit very different sensibility to light: the majority of them grow in the fullest sunlight, while some, *Evernia, Usnea, Peltigera, Graphis,* etc., are adapted to more or less intense shade. In alpine regions especially, orange and yellow thalli occur almost exclusively on the under, or shaded, side of rocks. This fact is explained by Zukal's researches, in which he found that the algal layer was most highly developed under a cortex orange or yellow in color, these colors being most penetrable by the rays active in carbon assimilation. The color of the cortex is also thought to be a protection against excessive illumination, though this explanation can scarcely hold for those

LICHENS.



1. Parmelia stellaris.
2. Cladonia retipora.
3. Parmelia olivacea.
4. Cladonia perfoliata.
5. Sticta pulmonaria.
6. Cladonia verticillata.
7. Parmelia caperata.
8. Cladonia squamosa (center); C. fimbriata (left); C. cornucopiæ (right).
9. Hagenia crinalis

lichens in which the lower cortex is highly colored. According to Schwendener, the growth of the thallus is largely intercalary, marginal or apical growth being relatively insignificant. In lichens with yellow-green algæ, the growth of the thallus is determined by the fungus, and the development of the algal layer takes place subsequently. In this process, the algæ and hyphæ show a tendency to aggregate into tubercles, which modify the surface of the thallus. Somewhat similar sculpturings are produced by tensions in the growing thallus, especially by the alternation of wet and dry periods. In nearly all of the gelatinous lichens, and particularly those parasitic on filamentous algæ, growth is controlled by the alga, and the fungus has little or no influence upon it.

The propagation of lichens occurs ordinarily by means of soredia. It may take place also by fragments of the thallus, whether abstricted naturally or cut off by accident. The propagative value of the pycnidium (spermogonium) in nature is unknown. The conidia have been germinated in cultures with difficulty, and at present there is no evidence that they grow more readily under normal conditions. Reproduction is a characteristic feature of the lichens: a few species produce apothecia rarely, while in certain sterile forms they are never developed. It is still an open question whether the apothecium is the result of fertilization. Some investigators have thought to demonstrate the presence of a carpogone and trichogyne, and to follow the development of a spore fruit, which results from the contact of spermatium and trichogyne. The germination of many spermatia points strongly to the conclusion that these are mere conidia and not male sexual cells. No fusion of sexual cells has yet been seen in lichens, and, until this is seen, it is impossible to settle the question of their sexual nature. The apothecium arises usually from certain more or less distinctly twisted hyphæ lying between the medulla and the algal layer. Sometimes the point of origin is just beneath the cortex, especially near the margin, and in crustose forms it is in the hyphal layer just above the substratum. The development is essentially the same as in the other cup-fungi; the hyphal fundament increases in size, and becomes differentiated above into two sorts of threads. The first to grow up are the paraphyses, in the centre of which push up the club-shaped branches, which become the asci. Spore formation in the ascus follows the method typical of all sac-fungi. The escape of the spores takes place through a terminal rift in the ascus or by the breaking up of the latter. The mature spores germinate readily under the proper conditions, usually sending out a single filament from each cell; large spores, however, such as those found in *Megalospora* and *Pertusaria*, produce many germinating filaments. The young mycelium is capable of slight development only, unless it comes in contact with the proper alga, when it grows at once into the thallus. The uncertainty that the spores will germinate in a place where the proper host occurs makes multiplication by spores much less sure than by soredia. In a few cases (***Endocarpon, Staurothele***, etc.), this disadvantage has been overcome by the development of algæ in the thecium between the paraphyses and spore-sacs (hymenial gonidia). These are ejected with the spores, and, clinging to the latter, furnish a certain substratum for the germination of the spores.

Origin and Classification.— Lichens are sac-fungi and rod-fungi which show more or less similarity in their vegetative body because of their parasitism upon certain algæ. The clew to their origin and relationship is to be found in the inherited reproductive organ, the sporocarp, and not in the thallus. From this standpoint, the group is highly artificial, containing representatives of two distinct classes of fungi, the *Ascomycetes* and the *Basidiomycetes*. The absidiolichens are a small group, containing but a few genera: the ascolichens consist of the representatives of several unrelated families. It is evident that the lichens have not arisen from a single point, as members or offshoots of one line of development, but that they have originated at several widely separated points. They are of multiple origin; that is, they are polyphyletic. In ascolichens, the form of the sporocarp indicates the main places of origin; the *Verrucariaceæ*, with perithecia, are *Pyrenomycetales;* the *Graphidaceæ*, which show the hysterothecium, belong to the *Hysteriales;* the remaining families, *Caliciaceæ, Collemaceæ, Parmeliaceæ*, etc., belong to the *Pezizales*.

The following synopsis will indicate the relationship and limits of the various families of lichens:

Class Ascomyceteæ: fruit a sporocarp, spores borne in sacs (asci).

Order Pyrenomycetales: sporocarp a perithecium.

Family Sphæriaceæ: mycelium filamentous, saprophytic or parasitic on tissues.

Family Verrucariaceæ: mycelium thalloid, parasitic on yellow-green algæ.

Order Hysteriales: sporocarp a hysterothecium.

Family Hysteriaceæ: mycelium filamentous, hysterothecium carbonaceous.

Family Hypodermataceæ: mycelium filamentous, hysterothecium membranaceous.

Family Graphidaceæ: mycelium thalloid, on algæ, hysterothecium membranaceous or carbonaceous.

Order Pezizales: sporocarp an apothecium.

Apothecia and thallus leathery, waxy or carbonaceous, never gelatinous.

Family Patellariaceæ: mycelium filamentous, mostly saprophytic.

Family Lecidiaceæ: mycelium thalloid, apothecium sessile, exciple without algæ (proper).

Family Cladoniaceæ: mycelium thalloid of two sorts, primary and secondary; apothecia borne on stalks (podetia), proper exciple.

Family Parmeliaceæ: mycelium thalloid, algæ yellow-green, exciple with algæ (thalline).

Family Pannariaceæ: mycelium thalloid, algæ blue-green, proper exciple.

Apothecia and mycelium gelatinous.

Family Bulgariaceæ: mycelium filamentous.

Family Collemaceæ: mycelium thalloid, on blue-green algæ.

Class Basidiomyceteæ: fruit a hymenophore, spores borne on stalks (basidia).

Order Hymenomycetales: hymenophore exposed on a pileus.

Family Thelephoraceæ: hymenophore smooth, mycelium filamentous or thalloid (in *Cora, Rhipidonema, Dictyonema* and *Laudatea*).

Order Gasteromycetales: hymenophore enclosed in peridium.

Family Sclerodermataceæ: peridium broad subsessile, gleba excavate, mycelium filamentous, or thalloid in Emericella.

Distribution and Role.— Lichens are distributed over the entire earth: they are least numerous in the tropics and reach their maximum development in alpine and polar lands, where they often form the principal vegetation over immense stretches. Many species are widespread, especially in the northern hemisphere: some of these, such as *Cladonia rangiferina, Urceolaria scruposa, Usnea barbata*, etc., are truly cosmopolitan. In the tropical and temperate zones, the greatest wealth of lichens is found upon bark and wood. In alpine and polar regions, the stone and earth forms are predominant. In these places, lichens play their most important part in the economy of nature. They take the initiative in the disintegration of the hardest rock by virtue of the acids secreted by the thallus; they are likewise very effective in binding together the new soils which result in this way and in contributing organic material by their decay. In all rocky habitats they are the pioneers which prepare the way for the appearance of more highly organized plants, mosses, grasses, etc. In the case of tree-lichens, the tree is not affected by the lichen, except in so far as the bark may be ruptured by it mechanically. It is a question whether lichens exert any really injurious effect upon timber, though they probably hasten the decay of boards, posts, etc., by increasing the amount of moisture present.

A few lichens are of value as food. The most important among these is the so-called «reindeer» moss, *Cladonia rangiferina*, which covers vast stretches in the north and constitutes an invaluable supply of food for the reindeer and caribou. In Japan, *Gyrophora esculenta*, which is collected in abundance in the mountains, is of sufficient importance to be an article of export. The arid regions in northern Africa and western Asia produce large quantities of the manna-lichen, which is used to make bread, especially by the Tartars. This lichen is readily torn away from the substratum by the wind and is carried often to considerable distance before falling as «manna rain.» This phenomenon has been observed repeatedly in modern times, and probably accounts for the manna of the Israelites. «Trip-de-roche» is an edible *Umbilicaria* of arctic America, but the presence of the bitter principle so common in lichens restricts its use as a food. Lichens owe their food value almost wholly to their high content of lichenin, or lichen-starch. Lichens, though once of extensive application in dyeing and in medicine, have fallen almost completely into disuse in both. The various kinds of orseille, which were made from *Roccella tinctoria* and held in high esteem for their brilliant purples, have been entirely replaced by the aniline dyes. Litmus, which is a similar dye made from a species of *Lecanora*, is still extensively used in chemistry because of its red coloration in the presence of an acid. «Iceland moss,» *Cetraria islandica*, is still used officinally: it contains cetrarin, a bitter principle which is tonic and astringent, and a large amount of lichenin.

Consult: Tuckerman, E., ‹Synopsis of the North American Lichens› (1882); Schneider, A., ‹A Text-book of General Lichenology› (1897); Schneider, A., ‹Guide to the Study of Lichens› (1898). Frederic E. Clements,

University of Nebraska.

Lichfield, lĭch′fēld, England, an episcopal city of Staffordshire, 17 miles southeast of Staffordshire. The principal edifice is the cathedral, a noble structure of early English and transitional architecture with a richly decorated west front, and three spires — two on the west, each 180, and one in the centre 280 feet high. The see of Lichfield was founded in 656. The city has interesting literary associations, Johnson, Addison, and Garrick, born in the town or neighborhood, having been educated at the old grammar school. Pop. (1901) 7,902.

Lichtenberg, Georg Christoph, gā-ōrg′ krĭs′-tŏf lĭн′ten-bĕrg, German satirical writer and physicist: b. near Darmstadt 1 July 1742; d. Göttingen 24 Feb. 1799. He was educated at the University of Göttingen and became professor there in 1767. During frequent visits to England he collected material for his explanations of Hogarth whom he thus assisted to popularize in Germany. He gained great celebrity as a lecturer on physical science. His being a hunchback may very possibly have embittered a naturally satiric disposition. The best of his satires are those on the notorious literary pirate Tobias Göbhard; the essay on ‹The German Novel›; ‹Timorus,› ridiculing Lavater's zeal for proselytizing; and ‹Pronunciation of the Wethers of Ancient Greece,› aimed at Voss's system of pronouncing Greek. His brilliant sayings have been collected and published in a separate volume, ‹Lichtenberg's Thoughts and Maxims: Light Rays from his Works› (1871).

Lichtenberg, Leopold, American musician: b. San Francisco, Cal., 22 Nov. 1861. In early childhood he showed his fondness for the violin and received careful training. In his 12th year was asked by Henri Wieniawski, then on a visit to California, to become his pupil, and accordingly spent three years at Brussels Conservatory. Fresh from his European successes, he was engaged in Theodore Thomas' orchestra and then spent three years more abroad playing in the chief cities. On his return to America he became a member of the Boston Symphony Orchestra and later was appointed head of the violin classes at the National Conservatory of Music, New York.

Licinius, lī-sĭn′ĭ-ŭs, **Gaius,** Roman tribune. He came of a plebeian family, but rose to the rank of tribune, receiving the surname of Stolo, or Useless Sprout, by reason of the law which he established forbidding any one to possess more than 500 acres of land. His reason for this was that when more land was cultivated by any one owner the latter could not pull up the useless shoots (*stolones*) which grew from the roots of trees. Another law of his enactment allowed the plebeians to share the consular dignity with the patricians; and he himself became one the first plebeian consuls, 364 B.C.

Licinius, Gaius Flavius, Roman emperor: b. Dacia about 270; d. 324. He was made Augustus by the emperor in 307, and became emperor of Rome after the death of Galerius about 312. He was defeated by his brother-in-law, Constantine, 323, and put to death the year following. His son, Flavius Valerius, declared Cæsar in 317, was slain at Constantinople in 326.

Lick, James, American philanthropist: b. Fredericksburg, Lebanon County, Pa., 25 Aug. 1796; d. San Francisco, Cal., 1 Oct. 1876. In 1821 he set up in the pianoforte business at New York, and later was a manufacturer of musical instruments at Buenos Ayres, Philadelphia, Valparaiso, and elsewhere. In 1847 he went to California, where he gained wealth through investments in real estate and various enterprises. In 1874 he placed $3,000,000 at the disposal of seven trustees, by whom they were to be applied to specified uses. The principal divisions of the funds were: To the University of California, for the construction of an observatory and the placing therein of a telescope to be more powerful than any other in existence, $700,000 (see LICK OBSERVATORY); for the building and maintenance of free public baths in San Francisco, $150,000; to found and endow an institution of San Francisco to be known as the California School of Mechanic Arts, $540,000; for the erection of three appropriate groups of bronze statuary to represent three periods in Californian history and to be placed before the city-hall of San Francisco, $100,000; to erect in Golden Gate park, San Francisco, a memorial to F. S. Key, author of ‘The Star-Spangled Banner, $60,000.

Lick Observatory, astronomical department of the University of California. James Lick (q.v.), by deeds made in 1874 and 1875, charged a board of trustees to expend the sum of $700,000 for the purpose of purchasing land and constructing «a telescope superior to and more powerful than any telescope yet made . . . and also a suitable observatory . . . to be made useful in promoting science.» Under the provisions of this deed a site was selected in 1876 on the summit of Mount Hamilton about 26 miles, by road, from San José, Cal. The land (about 3,000 acres) was granted at various times by the United States and by the State of California.

Astronomical observations of precision and delicacy require a steady atmosphere as well as a very transparent one, and the site chosen is favorable in both respects. This was thoroughly tested in 1879 by Prof. S. W. Burnham before any buildings were erected. The first board of trustees (D. O. Mills, president) chose as chief advisers Profs. Simon Newcomb and Edward S. Holden, and appointed Prof. Holden as director. In October 1874 the latter submitted a plan for the building of the observatory and a programme of work, which were accepted by the trustees, according to which the buildings were constructed and the work carried on from 1874 to 1897. The County of Santa Clara built a fine mountain road to the summit, in 1876, at a cost of $78,000. The work of construction was begun in 1880 by the third board of trustees (Capt. R. S. Floyd, president) with Thomas Fraser as superintendent. To obtain a level platform for the observatory 70,000 tons of rock were blasted from the summit. The instruments were ordered from specifications by Dr. Holden, except the object-glass of the great telescope. After a series of experiments Prof. Newcomb advised the construction of a refracting telescope for the main instrument of the observatory. The glass disks were founded by Feil & Mantois of Paris and figured by Alvan G. Clark. The finished objective is 36 inches in diameter, and has a focal length of 56 feet 2 inches. Besides the visual objective, there is a third lens of 33 inches aperture. When this is placed in front of the visual objective the combination becomes a photographic object-glass of 570 inches focal length (the diameter of the photographic image of the moon is about 5.2 inches). The cost of the visual objective was $50,000, of the photographic corrector about $13,000, and of the mounting of the telescope about $45,000. The cost of the dome complete was about $85,000; of the whole observatory about $610,000. The mounting of the great telescope was made by Warner & Swasey, of Cleveland. The whole weight of iron pier and mounting is about 37 tons. The moving parts of the latter weigh about 7 tons; the tube weighs nearly three tons. The telescope is used for visual purposes, and micrometer measurements; it is also used for photographic and for spectroscopic observations. Its steel dome is 75 feet in diameter, and weighs 100 tons. It was built by the Union Iron Works of San Francisco. The floor of the dome is movable vertically (about 16½ feet), according to a plan by Sir Howard Grubb, which ensures a convenient position for the observer, no matter whether the telescope is pointing horizontally or vertically. Other instruments are a 12-inch and a 6-inch refractor, a 4-inch comet-seeker, a 6-inch meridian-circle, a 5-inch photographic telescope, a 4-inch transit, a 5-inch photoheliograph, etc.

The great telescope has been in constant use since its erection, and its optical quality has been proved to be excellent. The admirable design and construction of its mounting and dome have much facilitated its work. In 1895 Edward Crossley, M. P., of Halifax, England, presented to the observatory his 3-foot reflector, which has been a powerful auxiliary to the great refractor. The observatory constitutes the Lick Astronomical Department of the University of California. The directors of the observatory have been: Edward S. Holden (1874 and 1885–97); James E. Keeler (1898–1900); W. W. Campbell (1900—). Its staff has comprised many noted observers: Messrs. Burnham, Barnard, Schaeberle, Tucker, Perrine, Hussey, Aitken, Wright and others. In 1888 the staff was composed of the director, four astronomers, and one assistant. The staff of the observatory in 1903 consists of the director, 3 astronomers, 2 assistant astronomers, 4 assistants, 3 fellows, 1 secretary.

The observatory was one of the very first to be located on a site specially chosen for its adaptation to astronomical work, and its success has had an important effect upon the science of practical astronomy. No one would now think of locating a great observatory without careful consideration of the site to be occupied. The mountain observatories of the world owe much to the experiments made at Mount Hamilton.

The principal objects of research have been: The visual and photographic observation of planets and satellites; the fifth satellite of Jupiter was discovered here by Barnard in 1892. A systematic search for comets has been kept up and 14 unexpected comets have been discovered — Barnard (3), Perrine (9), Coddington

(1), besides a comet discovered by Schaeberle during his observations of the solar eclipse in Chile. Many periodic comets have also been detected and observed. The orbits of new comets have always been promptly computed at the observatory and ephemerides sent out to other stations. Four asteroids were discovered by Coddington in 1898-9. Meteors have been observed and photographed, and their orbits calculated. Double stars have been assiduously observed and many new discoveries made by Burnham, Hussey and Aitken; the orbits of a considerable number of binaries have been calculated. Observations of the zodiacal light and of the aurora have been made by Barnard and others. Successful expeditions have been sent to observe all total solar eclipses since 1888, and very much has been added to our knowledge of solar physics in this way. The transit of Venus of 1882 and three transits of Mercury have been observed and photographed here. The positions of a large number of fixed stars have been determined with great precision by Tucker. Many photographs of the sun and moon have been made. The negatives of the moon have been utilized in the preparation of an atlas of the moon (scale 10 feet to the moon's diameter) by Prof. Weinek, and on a scale of three feet by Messrs. Holden and Colton. A great number of important photographs of the milky way were made here by Professor Barnard and others, and of comets and nebulæ by Keeler, Hussey, Perrine and others. A complete outfit of seismometers for recording the intensity of earthquake shocks was installed at the observatory in 1888, and it was supplemented by similar instruments at Berkeley and at other points in California and Nevada, which regularly report to Mount Hamilton. In this way the elements for a seismometric record for the State were collected and regularly published. At the same time a list of all recorded shocks on the Pacific coast since 1769 was compiled and discussed by Dr. Holden. Spectroscopic observations of nebulæ, new stars, comets, stars and planets have been made in great number and with previously unattained precision by Messrs. Keeler, Campbell, Wright, Perrine and others.

The chief problem of the great telescope is to determine the motion of the solar system by spectroscopic observations. The photography of stellar spectra was proposed in the plan of 1874 and attacked in 1888, and it has been followed with marked success, especially in the hands of Prof. Campbell. Since 1896 more than 2,000 negatives of stellar spectra have been secured. A preliminary discussion by Campbell leads to the result that the solar system is moving toward a point in 277° R. A. and 20° N. D., at a speed of 19.89 kilometers (12.35 miles) per second. An expedition was sent (at the cost of D. O. Mills) to the Southern hemisphere in 1903 to extend this research to Southern stars.

The observatory publishes a series of octavo 'Contributions' (No. 1 in 1889, No. 5 in 1895), of quarto 'Publications' (Vol. I. in 1887, VI. in 1903) and a quarto 'Bulletin' since 1901 — a journal. The Astronomical Society of the Pacific founded by Prof. Holden in 1889, has close relations with the observatory, and has printed 15 octavo volumes. Visitors are freely admitted to the observatory in the day time to the number of 5,000 or more annually. On Saturday evenings visitors are admitted to look through the telescopes, and as many as 150 to 200 are frequently registered. In this way the observatory has rendered important services to popular education. Edward S. Holden,
Librarian U. S. Military Academy, West Point.

Lick'ing, (1) a river of Kentucky, rising in Floyd County, among the Cumberland Mountains, and, after a course of about 200 miles, falling into the Ohio at Newport, opposite Cincinnati. (2) A river of Ohio, the former Indian Pataskala, rising near the centre of the State, and, after a course of 80 miles, flowing into the Muskingum near Zanesville. It furnishes valuable water power.

Lic'orice, or **Liquorice,** a genus of perennial herbs (*Glycorrhiza*) of the order *Leguminosæ.* About a dozen widely dispersed species are recognized, of which *G. glabra* is the most important, since it furnishes the licorice of commerce. It is characterized by long rootstocks, odd-pinnate leaves, and racemes of separated flowers of various colors, usually pale violet. The plant is a native of southern Europe and western Asia, and is cultivated in Spain, Italy, Russia, and some other countries of the old world, the best grades coming from the first two countries mentioned. The roots and the extracted sweetish principle, of which about $500,000 worth are imported into the United States annually, are used in making plug tobacco and porter, to flavor cooling drinks, and by druggists to disguise the unpleasant taste of some drugs. Attempts to cultivate the plant in Louisiana and California has proved partially successful, but the crop is not profitable, since three to four years must elapse before it can be dug, and the selling price is small. Cuttings of the rootstock are planted about three feet apart, and when established the plants are allowed to shift for themselves until harvest, when the land is plowed and the rootstocks pulled by hand. No further planting is necessary, since the bits of root left will restock the land.

Lic'tors, in ancient Rome, a name given to those public servants who attended upon the chief magistrates to fulfil their commands, bearing axes tied up in bundles of rods, which were called *fasces.* When a magistrate of high rank appeared in public the lictors preceded him in a file, following each other. It was their duty to clear the road of the populace. The dictators were preceded by 24 lictors; the consuls, decemvirs, and military tribunes, by 12; the provincial prætors, master of the horse, and proprætors, by six; and the quæstors by five.

Liddell, lĭd'ĕl, **Henry George,** English Greek scholar and Anglican clergyman: b. 6 Feb. 1811; d. Ascot, Berkshire, 18 Jan. 1898. He was educated at the Charterhouse and Christ Church, Oxford; took priest's orders in 1838; and for some years lived in Oxford as a tutor of Christ Church. He took no part in the theological controversies which stirred the Oxford of his time, but worked steadily with R. A. Scott of Balliol, afterward Dean of Rochester, at the 'Greek Lexicon' — the well-known 'Liddell and Scott' of successive generations of students — which forms his chief title to remembrance. It first appeared in 1843, but has undergone extensive revision and enlargement in subsequent editions, of which the 8th appeared in 1897. In 1846 Liddell was appointed the head-master of Westminster School, and in 1855 became dean of Christ Church. He held the deanery till his retirement to Ascot in 1891, and during his rule many salutary changes were introduced. Besides the ‘Lexicon,’ founded on the Greek-German lexicon of Passow, he wrote a ‘History of Rome’ (1855), afterward abridged as ‘The Student's Rome.’ Consult Thompson, ‘A Memoir of H. G. Liddell’ (1899).

Liddon, lĭd'ŏn, **Henry Parry,** English clergyman: b. North Stoneham, Hampshire, 20 Aug. 1829; d. Weston-super-Mare 9 Sept. 1890. He was educated at Christ Church, Oxford, where he was graduated in 1850. The year after his ordination to the priesthood he was appointed vice-principal of Cuddesdon College, which bishop Wilberforce of Oxford had recently founded, but resigned in 1859 and became vice-principal of St. Edmunds Hall, Oxford. In 1870 he was chosen as Ireland professor of exegesis, but after the Universities Commission had completed their work, which he looked upon as desecrating, he resigned (1882). From 1870 till his death he was canon of St. Paul's and his sermons under the dome attracted crowds of breathless hearers. He was in fact the last prominent survivor of the theological school represented by Pusey and Keble, and carried its tradition even into the period of the new Oxford movement represented by ‘Lux Mundi,’ a work which he ardently controverted. He also was prominent in the controversies concerning the Public Worship Regulation Act, which he opposed, and the Athanasian Creed, which he defended. An inflexible High Churchman, an uncompromising theologian of the Nicene school, he had much influence even where his rigid dogmatism carried no conviction, through the loftiness of his personal character, his transparent sincerity and a noble eloquence, whose power and sweetness recalled the best utterances of Bossuet and Massillon, preachers on whom he palpably bestowed much earnest study. During the last years of his life he was engaged in writing Pusey's life on a voluminous scale, but had completed but three volumes when he died. He was elected bishop of Edinburgh, in 1886, while traveling in the East for his health, but his decline prevented him from accepting. He published many sermons, but the only series likely to prove of permanent importance is his Bampton Lectures ‘On the Divinity of Our Lord and Savior Jesus Christ’ (1866).

Lie, lē, **Jonas Lauritz Edemil,** Norwegian novelist: b. Eker, Norway, 6 Nov. 1833. He was educated at the University of Christiania and in 1859 settled as a lawyer at Kongsvinger, to the northeast of Christiania. He went to Christiania in 1868 to support himself by journalism and literary work, and in 1870 became famous with his novel ‘The Visionary.’ The profits from its publication enabled him to spend some time in northern Norway, and to visit Holland, Belgium, France, and Italy. Returning in 1874, he received the poet's pension from the Storthing, resided in Dresden 1877–81 and from 1882 till 1891 lived in Paris in comparative retirement writing his most notable works, and in the latter year he went to Rome, from which he returned in 1892 to Norway. The following are his chief novels and stories: ‘The Visionary’ (1870); ‘Stories and Sketches of Norway’ (1872), containing the story entitled ‘The Horse of Nordfjord’; ‘The Three-Master Future, or Life in the North’ (1873), a series of loosely connected stories or sketches dealing with the life of Norwegian seamen; ‘The Pilot and his Wife’ (1874), showing a considerable advance on his earlier works; ‘Thomas Ross’ (1878); ‘Adam Schrader’ (1879); ‘Rutland’ (1880); ‘Forward! Scenes of the Sea’ (1882); ‘Life's Slaves’ (1883), a powerfuly realistic study of a soul involved in the net of circumstance; ‘The Family of Gilje’ (1884), a lighter story of Norwegian life; ‘The Gulf’ (1885), treating of the gradual decline of an old Norwegian family; ‘Eight Stories’ (1885); ‘The Commandant's Daughters’ (1886), by many regarded as his masterpiece; ‘Two Lives’ (1887), a penetrating study in the psychology of marriage; ‘Maisa Jons’ (1888); ‘Mischievous Powers’ (1889); ‘Trold’ (1891–2); ‘Niobe’ (1893), in which his subject is family troubles arising out of differing social, political, or religious views held by parents and children; and ‘Grandfather’ (1895). He published a volume of poems in 1867, and he has writen several dramas, ‘Faustina Strozzi’ (1875), ‘Grabow's Cat’ (1880), and ‘Merry Wives’ (1894). In 1894 he published an important critical work, ‘Honoré de Balzac, The Man and the Artist.’ Lie's chief works have been translated into German, English, and other languages. He is a realist with a fine sense of humor and profound sympathy with the humble and the unfortunate, and is a master in psychological analysis.

Lieber, lē'bėr, **Franz,** American publicist: b. Berlin, Germany, 18 March 1800; d. New York 2 Oct. 1872. He volunteered as a soldier at 15, and was in the battles of Ligny, Waterloo, and Namur. He served also in the Greek war of independence, recording his experiences in ‘Journal in Greece’ (1823). He settled in the United States in 1827, and during the next five years was occupied with the compilation of an ‘Encyclopædia Americana’ (13 vols.). While professor of history and political economy in South Carolina College (1835–56), he wrote the three great works by which he is best known, ‘Manual of Political Ethics’ (1838); ‘Legal and Political Hermeneutics or the Principles of Interpretation and Construction in Law and Politics’ (1839); ‘Civil Liberty and Self Government’ (1853). In 1857 he became professor of history in Columbia and later of political science in the Columbia Law School. During the Civil War period he was a firm supporter of the Federal government and was frequently consulted by the secretary of war. His war code, officially designated as ‘Instructions for the Government of the Armies of the United States in the Field’ (1863), made him still more widely known. He was a member of the French Institute and of many learned societies at home and abroad. Consult ‘Lives’ by Perry (1882); Harley (1899).

Lieber, Oscar Montgomery, American mineralogist and chemist: b. Boston, Mass., 8 Sept. 1830; d. Richmond, Va., 27 June 1862. He was a son of Franz Lieber (q.v.) and was educated at the Universities of Berlin and Göttingen and the School of Mines at Freiberg, Saxony. In 1850 he became State geologist of Mississippi and afterward engaged in the survey of Alabama and South Carolina. In 1860 he went to Labrador as geologist of the American astronomical expedition. During the early part of the Civil War he served in the Confederate army and was fatally wounded at the battle of Williamsburg. He published ‘The Assayer's Guide’ (1852); ‘The Analytical Chemist's Assistant’ (1852); ‘Geology of Mississippi’ (1854).

Liebig, Justus, yoos'toos lē'bĭg, Baron von, German chemist: b. Darmstadt 12 May 1803; d. Munich 18 April 1873. He studied in Bonn and Erlangen, was graduated in 1822, and the same year went to Paris, where he gained the favor of Humboldt by his paper on fulminic acid and the fulminates, read before the French Academy (1824). He thus obtained access to the private laboratory of Gay-Lussac. In 1824 he was appointed extraordinary professor and in 1826 ordinary professor of chemistry at Giessen. Here he opened the first experimental laboratory for college students, and the university soon became the European centre of chemical studies. He had remarkable success as a teacher, and pupils streamed into his class room from every country. The most illustrious chemists of the last century acknowledge their obligations to him as their master. He gave chemistry a settled position in Germany, and turned it into a real science to be taught and learnt by means of experiment. As an original investigator in the domain of chemistry he has shown himself a reformer of the sciences of physiology and agriculture. He may be said to be the founder of modern organic chemistry, and its necessary method of analysis. He analyzed many organic acids; discovered chloroform and chloral; he made the theory of the composition of ether, and the oxidization of alcohol subjects of new experiments, in the course of which he discovered aldehyde. He determined the basicity of many acids; analyzed the chemical composition of urine and the products of uric acid, and made profound inquiries into the juice of flesh, and its component substances. He raised chemistry from a position of obscurity and unprofitable hypothesis into its present all dominating position by his theory of the constitution of alcohol, ether, etc., and his work on the benzoyl compounds is especially remarkable in this connection. The industrial importance of his discoveries is great. Cyanide of potassium is largely employed in electroplating and in the manufacture of ferrocyanides. His improved method of producing this cyanide has cheapened manufacture, just as his discovery of aldehyde has led to improved methods in the making of vinegar and looking-glasses. The result of his vast discoveries has been especially felt in the domains of medicine, agriculture, and food-hygiene. His great generalization that the mineral and organic world were composed of the same chemical elements, and were subject to the same chemical mutations, revolutionized science. He traced for the first time the transformation of inorganic into organic substances in plants, from which they were transferred to the organisms of animals. His exact statement of the elements received by plants from the soil and air enabled him to prescribe the composition of efficient fertilizers and thus, in the treatment and analysis of soils, to raise the fundamental operations of agriculture to the level of exact science. See Chemistry; Agriculture.

Consult: Liebig, ‘The Natural Law of Husbandry’ (1863); ‘Animal Chemistry in its Application to Physiology and Pathology’ (1846); ‘Handbook of Organic Analysis’ (1853); Hoffmann, ‘The Life-Work of Liebig in Experimental and Philosophical Chemistry’ (1876).

Liebknecht, Wilhelm, vĭl'hĕlm lēp'knĕʜt, German Socialist: b. Giessen 29 March 1826; d. Berlin 6 Aug. 1890. He studied at the University of Giessen and later at Marburg and Berlin. He was early interested in the writings of St. Simon, and in 1848 went to Paris to take part in the revolution there; then joined in the unsuccessful attempt to make Germany a republic, and was imprisoned nine months without trial. When released he went to Switzerland, where he tried to unite the trade unions on a socialistic basis, was again arrested, handed over to the French authorities, and banished to England. While there he became an intimate friend of Marx and Engels (qq.v.) and was a member of the Communist League. In 1862 he returned to Germany, continued his socialistic agitation, and in 1865 was banished from Prussia. He went to Leipsic, where he met Bebel (q.v.), was active in trade union organization, and was one of the founders of the Saxony Volkspartei soon absorbed by the German Social Democratic party (1868), of which he was from the first a leading member. In 1867 he was candidate for the North German Parliament, but was under arrest and lost the election; he was later elected. In 1868 he was made editor of the ‘Demokratisches Wochenblatt,’ the next year enlarged and published under the name of ‘Volkstatt.’ In 1870 he denounced the Franco-Prussian war, for which he was imprisoned three months, and later so bitterly attacked Bismarck that he was again imprisoned. In 1874 he was elected to the Reichstag of which he was a member almost constantly till his death. He was one of the strongest leaders of his party in that body, and very popular and highly respected among German workingmen. In 1890 the name of the ‘Volkstatt’ was changed to ‘Vorwärts,’ and Liebknecht was retained as editor. He has written ‘Die Grund- und Bodenfrage’ (1874), a discussion of the land question from the Socialist standpoint; ‘Ein Blick in die Neue Welt’ (1887), an account of his visit to the United States; ‘Robert Blum und seine Zeit’ (1890); ‘Robert Owen’ (1892); and ‘Socialism, what it is and what it seeks to accomplish’ (translated and published in the United States). Consult: Aveling, ‘Wilhelm Liebknecht and the Social Democratic Movement’ (1896).

Liechtenstein, lēʜ'tĕn-stīn, a small independent principality, practically a portion of the Austro-Hungarian monarchy and united with the Austrian Customs-Union since 1866, between Vorarlberg, Tyrol, and Switzerland; area, 65 square miles, pop. (1901) 9.477. The surface has a fertile soil, yielding abundance of pasture, corn, wine, fruit, and flax. The capital, Vaduz, has about 1,000 inhabitants. The reigning family date from the 12th century, and are descendants of free barons who became princes of Liechtenstein in 1608.

Liège, lē-āzh, Belgium, (1) the easternmost province bordering on Rhenish Prussia and the Netherlands. Area 1,117 miles. The surface is diversified with heights varying from 300 to 2,000 feet, and well wooded. It contains rich coal and iron mines. The northern part called Herveland is exceedingly fertile and highly cultivated, affording pasturage for cattle and producing large quantities of butter and Limburg cheese. Pop. (1900) 826,175. (2) An episcopal city and the capital of the province at the confluence of the Ourthe and Meuse, 54 miles southeast of Brussels. The city has been considerably modernized since 1860 by the construction of fine quays and bridges along the course of the Meuse throughout the city. It has numerous striking public buildings including the Gothic cathedral of St. Paul, the Palais de Justice and the celebrated university, occupying extensive grounds, with special institutes for various sciences, a school of mines, a school of arts and manufactures, and an important library. Liège is one of the largest manufacturing towns of Europe, owing principally to its situation in a district abounding with coal, iron, lead, copper, and marble. Cannons and firearms of every description, steam engines, and machinery, hardware of every kind, watches, jewelry, bronze and other ornaments, woolens, cottons, etc., are made. Liège dates from the 6th century. Pop. (1900) 173,706.

Lien, lē'ĕn or lēn, a legal claim on or upon property; a legal right in one person to detain the goods of another until some claim of the former against the latter has been satisfied. Blackstone says a lien may be either particular or general; the former is where the claim of retainer is made upon the goods themselves, in respect of which the debt arises, a claim which the law favors. The other, or general lien, is where goods are retained in respect of a general balance of account, which is less favored. Though general liens are not favored by law, yet in some cases they have become allowed and established by usage, as in the case of attorneys upon the title-deeds and documents of their clients; and factors, warehousemen, and others, upon goods confided to them in the ordinary course of business.

Lieuely, Greenland. See Godhaven.

Lieutenant, lū- or lĕf'tĕn'ạnt, a military term, which, like captain, and many others, has received gradually a much narrower meaning than it had originally. Its true meaning is a deputy, a substitute, from the French *lieu* (place, post) and *tenant* (holding). A *lieutenant-général du royaume* was a person invested with almost all the powers of the sovereign. Lieutenant-general is the title of the commanding general of each division of an army, personating the general-in-chief. Lieutenant-colonel is the officer between the colonel and major. The term lieutenant by itself, in military language, signifies the officer next below a captain, whether in the cavalry or infantry. There are also second lieutenants ranking below lieutenants. A lieutenant in the navy is the officer next in command to the captain of a ship. He takes rank both in the British and United States services with a captain in the army, and after eight years' service he ranks in Britain with a major. In the United States a lieutenant ranking with a major is called lieutenant commander.

Lieutenant-colonel, a military title, the officer next in rank to a colonel, and the senior of a major. He has actual command of a regiment, and is responsible for the discipline and comfort of the troops under his command.

Lieutenant-general, formerly general officer in the United States army, ranking above a major-general and below a general. The office of lieutenant-general was first created by Congress for George Washington in 1798, during the troubles between the United States and France. It then lapsed till renewed by Congress for Gen. Winfield Scott, who was made lieutenant-general by brevet. In 1864 it was again revived for Gen. U. S. Grant, and continued for Generals Sherman and Sheridan. The grade was also conferred on Gen. John M. Schofield, 5 Feb. 1895, who held it till his retirement, 29 Sept. following. An act of Congress of 6 June 1900 provided that "the senior major-general of the line commanding the army shall have the rank, pay and allowances of a lieutenant-general"; and on the reorganization of the army in February 1901 the grade was revived and President McKinley appointed Maj.-Gen. Nelson A. Miles its incumbent. In 1903 the rank was again abolished, an act of Congress providing for a General Staff, the chief of staff to take the place of the lieutenant-general.

Lieutenant-governor, an executive office of several of the States, ranking next to the governor. He performs the duties of a governor in case of the latter's death, absence from the State, or inability to act, and is presiding officer of the State senate.

Liezen-Mayer, lē'tsĕn-mī'ėr, **Alexander,** Hungarian painter: b. Raab, Hungary, 24 Jan. 1839; d. 1898. He studied at Vienna and Munich, attending the art academies in those places, and afterward entered the studio of Piloty (1862) in the latter city. Under this master he painted his 'Queen Maria and Elizabeth of Hungary at the Grave of Louis le Grand' and 'The Coronation of Charles of Durazzo in the cathedral of Stuhlweissenburg.' Three years later he carried off the first prize at the Munich Academy exhibition. In 1867 he painted 'Maria Theresa'; 'The Child of a Poor and Sickly Mother'; and as drop-scene for the Munich theatre, 'Poesy Surrounded by the Muses.' In 1867 he began to paint portraits, and also furnished illustrations for the works of Goethe and Schiller. During a residence in Vienna (1870–2) he executed portraits of the emperor and many of the nobility. On his return to Munich he painted some ideal figures from Shakespeare's 'Cymbeline,' and some scenes from Goethe's 'Faust'; and in 1873 'Elizabeth Signing the Death Warrant of Mary Stuart' (in the Museum at Cologne), and one of his masterpieces, although its principal merit lies in the perfection of the technique. He produced also many cartoons for woodcut reproduction as illustrations of the poets. For three years he was director of the Art School at Stuttgart (1880–3), when he was appointed professor of historical painting in the Munich Academy.

Life. No definition of life has ever proved quite satisfactory. Some include too much, others omit certain phenomena, a third class assume conditions purely hypothetical, while many are unintelligible. Bichat says that life is "the sum total of the forces that resist death»; Treviranus, that it is «the constant uniformity of phenomena with diversity of external influences»; Duges, that it is «the special activity of organized bodies»; and Beclard, that it is «organization in action.» De Blainville's definition is: «Life is the twofold internal movement of composition and decomposition, at once general and continuous.» But according to Herbert Spencer this conception is in some respects too narrow and in others too wide. Of his own definition, that it is «the co-ordination of actions,» he says—«like the others this definition includes too much, for it may be said of the solar system with its regularly recurring movements and its self-balancing perturbations, that it also exhibits co-ordination of actions.» His amended conception of life is: «The definite combination of heterogeneous changes, both simultaneous and successive, in correspondence with external co-existences and sequences.» G. H. Lewes suggests the definition: «Life is a series of definite and successive changes, both of structure and composition, which take place within an individual without destroying its identity.» This is one of the most satisfactory definitions that has as yet been given. The most recent attempts have been in the direction of proving that life is merely a form of energy or motion, and show the influence which the physical sciences have had in recent years over knowledge and speculation, which formerly were mainly based on biology and theology. The simplest answer to the question probably is: Life is metabolism.

Leaving the subject of attempted definition, it will be profitable to observe some of the characteristics of life as compared with its absence; that is, substantially, a comparison of the organic with the inorganic part of the universe. The boundary between living and not-living matter is much less distinct than rough inspection suggests, but some of the most striking characteristics which distinguish living organisms from other objects of our experience which are not-living may be pointed out. The distinctive properties of living matter are, first, the fact that it is organized; second, that it has the power of perpetuating itself within definite limits by chemically taking and adapting (assimilating) suitable material from the surrounding media, and in the process generating heat (energy) in the absence of which it disappears; and, third, that it has the power of self-reproduction. Life cannot exist without that chemical interchange between the organism and its inorganic environment, and between the constituent parts of the organism which is summed up in the word metabolism (q.v.). Objections have been made to some of the definitions quoted above, and to others, that they assumed the existence of organization. But so far no evidence is present of any living thing without organization. The simplest one-celled animals and plants (see AMŒBA; PROTISTA) consist of organized protoplasm. This fundamental living substance, called protoplasm (q.v.), is of complicated structure and chemical composition. Its structure differs in different organisms; but it everywhere consists of a combination of viscous «plasma» and water. The plasma contains the chemical substances upon whose changes life depends. Protoplasm is, however, not homogeneous. At least two kinds are found in every mass, the cytoplasm constituting the major part of the whole; and the nucleus, the nutritive and reproductive centre. The combination of cytoplasm and nucleus forms a cell. Combinations of cells constitute the bodies of all organisms, large or small, past or present. These combinations are accumulations resulting from the property, characteristic, regularly and fundamentally, only of living organisms, of the doubling of molecules, by which growth is effected.

The fundamental vital phenomena may be regarded as (1) nutrition and (2) reproduction. The conditions under which these activities may be manifested are narrow in general, and the more closely limited in respect to a particular organism in proportion as its organization is more or less complicated. These conditions belong to the environment, from which the organism must take the elements necessary to its continued repair of loss—in other words, get food. Essential elements are oxygen, water, and certain salts; in a word, all the constituent elements of protoplasm, at the least, must be obtainable from the air or water, in order that vitality may persist. It is needful, however, that certain harmful things (poisons) should be absent, or the organism will be killed. Death will also follow excess or deprivation of the proper proportions of the food elements; too much or too little water; a raising or lowering of the temperature above certain points; the presence of light, proper electrical conditions, etc. The simplest animals and plants, consisting of little except protoplasm and water, have great power of resistance to untoward conditions, and the range of diversity in circumstances in which they are able to survive is very wide. Protozoans, eggs of lowly animals, spores of fungi, and the like, slowly dried show the possibility of persistence for prolonged periods without water. Small nematode worms are said to have survived desiccation for 14 years; and certain starchy seeds, kept thoroughly dry, may germinate after 10 or 20 years. As to temperature, dry yeast will live after exposure to 70° C., and a portion survives even at 100° C.; Pasteur heated dry fungoid spores without fatal results to 120° C., but the same when moist were killed at the boiling-point. Some bacteria are said to resist boiling, but the reverse is usually true. Kühne killed marine amœbæ at 35° C., while fresh-water forms stood 10° more. Even seeds have been known to withstand 100° C., but it is familiar that a longer exposure to much lower temperature is usually fatal. Higher plants have been known to survive burial under a glacier for four years; and fishes, frogs, etc., have often revived after being frozen hard in ice. Dry yeast, according to Cagniard de la Tour (quoted by Huxley), survived —60° C., but when moist was killed at —5° C.; yet Cohn cooled bacteria to —18° C. without death, and seeds have survived such an extreme as —120° C. To illustrate the diverse sensitiveness of animals, Semper notes that a temperature about the freezing-point of fresh water kills Infusoria but not pond-snails, that the minimum of vital activity in the former was seen at 4° C., in the latter at 12° C., yet the optimum for both is the same, namely, about 25° C. These facts illustrate how wide are the conditions to which some organisms have been able to adapt themselves; but they show that limits exist; and only emphasize the fact of common knowledge that life in its higher manifestations is dependent upon the maintenance of a few well-defined conditions, and that innumerable accidents may bring it to a permanent end (see DEATH), whereupon the material which it animated instantly becomes inert matter subject only to the laws that govern the inorganic world.

Reproduction is the means of securing that continuity of life which is one of its primal characteristics, and consists in the separation from the original organism of a part, relatively greater or less in proportion as the organization so divided is simple or complicated, which part is equally endowed with the potentialities of living and reproduction, and normally will reproduce its kind in turn.

For an account of the speculations and reasoning as to the origin of life on the earth, see ORIGIN OF LIFE; PROTISTA.

Life and Advent Union. See ADVENTISTS.

Life-boat, a boat for saving persons from shipwreck, and so built that it can live in a stormy sea. It must be constructed with strength sufficient to resist violent shocks from the waves, the rocky beach, or collision with the wreck; be buoyant enough to avoid foundering, and to float though loaded with men and filled with water; have facility in turning; and when capsized be able to right itself. Such boats are now maintained at most of the life-saving stations in America and Europe, ready to put to sea at once if their services are required, and provided with the means of being conveyed to the beach and launched with all possible rapidity. The first patent taken for a life-boat was as early as 1785. In 1789 Henry Greathead of England patented the best form of life-boat, and by the year 1804 his boat had saved nearly 300 lives. Till 1851 Greathead's invention was almost the sole one in use, though numerous others had been either introduced or proposed; but in that year no fewer than 50 models of improved life-boats were sent to the London Exhibition in competition for a prize offered by the Duke of Northumberland for improved construction. James Peake of Woolwich Dockyard, by combining the excellencies of the competitive boats, and adding others suggested by his own experience, designed a boat which, gradually improved from time to time, became the recognized model, and has been adopted as the standard for boats in all countries. This life-boat possesses in the highest degree all the qualities which it is desirable that a life-boat should possess:—1. Great lateral stability, or resistance to upsetting. 2. Speed against a heavy sea. 3. Facility for launching and taking the shore. 4. Immediate self-discharge of any water breaking into her. 5. The important advantage of self-righting if upset. 6. Strength. 7. Stowage-room for a large number of passengers. The great breadth of beam (8 feet) in proportion to her length (33 feet) is to diminish the liability to capsize in a heavy sea. The relieving-tubes, by which any water that breaks into the boat is immediately self-discharged, are a most beautiful contrivance. Such are the precautions for the safety of the crew that loss of life in the conduct of the boat is of rare occurrence. The life-boat transporting carriage is an important auxiliary to the boat. The life-boat is kept on this carriage in the boat-house ready for immediate transportation to the spot most favorable for launching to the wreck. In this way a greater extent of coast can secure the benefits of the life-boat than could otherwise be the case. Even when the launch is from the immediate vicinity of the boat-house the use of the carriage saves much time, which in a case of shipwreck may prove of the last importance. Besides, a boat can be readily launched from a carriage through a high surf, when without a carriage she could not be got off the beach. The machine is admirably contrived, and the boat may be launched from it in an upright position with her crew on board. To render it more manageable and of the greatest possible utility, the fore and main bodies can be detached from each other by the withdrawal of a forelock pin.

Life-buoys. See LIFE-PRESERVERS.

Life-estate, in the common law, as applied in England and the United States, a freehold not of inheritance; an estate or interest in real property for a life, and which is either conventional or legal. A conventional life-estate is expressly created by the act of the parties, and is for the life of the owner, or for the life of another, in which case it is called an estate *pour autre vie.* A legal life-estate is either tenancy-in-tail after possibility of issue extinct; or what in the older country is technically designated courtesy of England, that is, the life-interest held by a husband in his wife's fee-simple or fee-tail estates, general or special, after her death; or dower, that is, the right which a wife has for her life in the third part of the lands and tenements held in fee-simple, fee-tail-general, or as heir in special tail by her husband at the time of his decease. The tenant for life may cut wood to repair fences and for household fuel. If there is an open mine on the estate he may work it for his own profit, but he cannot open one. See ESTATE; FEE; FEE SIMPLE; ENFEOFFMENT; FORFEITURE.

Life-everlasting, one of the everlastings (*Anaphalis margaritacea*), called the pearly or large flowered; also silver-leaf, cotton-weed, none-so-pretty, etc. See EVERLASTING.

Life-insurance. See INSURANCE, LIFE.

Life-mortars. See LIFE-ROCKETS.

Life-preservers are inventions for the preservation of life in cases of shipwreck. In the mercantile marine and passenger ships there are now life-belts for every passenger and every member of the crew. Buoys are carried on the bridge and at the stern of most ships in the mercantile marine. The danger to ships' ordinary life-boats is that, from being so long out of the water, unless attended to they get so dry that when floated they fill. Although against regulations, these boats have been known to be filled with cargo. Sometimes the handiest life-buoy is an empty water-cask, well bunged up, and with ropes around it to hold on by. There are various kinds of buoyant pillows, life-jackets of india-rubber cloth, and mattresses. The cork-mattress can float three men in an upright position.

The life-belt commonly used was designed by Admiral Ward of England. It is made of cork covered with canvas, and is both strong and buoyant. It has four separate compartments, so that if one should be punctured and burst, the belt's buoyant power is not entirely destroyed. Each life-belt must have sufficient extra buoyancy to support a man heavily clothed, with his head and shoulders above the water, and to enable him to support another person besides himself. It must be flexible in order to fit tightly into the shape of the wearer. There is a division between the upper and lower parts so that it can be securely fastened round the waist, and not impede breathing or the muscular action of the chest or arms. See LIFE-BOAT; LIFE-RAFTS.

Life-rafts are various floating apparatus for saving life in case of shipwreck. A life-raft invented in England in 1870 is triangular in shape, and constructed of wood, cork, and rope-netting. It has the advantage of being handy and could be easily hauled to and fro between a ship in danger and the shore. Other patent life-rafts are merely square frames buoyed up by a cask at each corner. Empty water-casks well bunged up are very ready and effective instruments of safety in shipwreck, and should have ropes attached to them to hold on by. Frames of bamboo and inflated skins have long been in use as life-preservers among different nations, and contrivances more or less ingenious to preserve the buoyancy of the body in case of accidental immersion in water, are resorted to in all countries. Whatever is lighter than water, if used on account of its buoyancy as a means of personal safety, may be considered a life-raft. See LIFE-BOAT; LIFE-PRESERVERS.

Life-rockets are projectiles to communicate between a distressed ship and the shore. These are especially useful where no life-boat can be had, or where it cannot be used on account of the roughness of the sea. They are available, however, only at moderate distances from the shore. By means of them a rope is thrown either from the ship to the shore, or from the shore to the ship, generally the latter, and when communication is thus established a slinging apparatus may bring the crew ashore one by one. Of the numerous projectiles for life-preserving purposes one of the simplest is the heaving-stick, which can be discharged by hand, but cannot be relied on for distances greater than 50 yards. A piece of stout cane two feet long, one end loaded with two pounds of lead, and the other attached to a thin line, is whirled vertically twice or thrice, and then discharged. Kites have been tried, but cannot be relied on with certainty, the most reliable missiles being those that are discharged from a mortar or gun by gunpowder, having a line attached to them. The first trial of this kind was made in 1791 by Sergeant Bell, of the English artillery, who fired his projectile from the ship to the shore, but it was soon perceived that it was better to fire from the shore to the ship. The life-mortar of Captain Manby was invented in 1807, and is practically still that in use, though variations in details have been made on it from time to time. His missile was a shot with curved barbs, resembling the flukes of an anchor, to grapple the rigging or the bulwarks of a ship. The shot was fastened to the rope by strips of rawhide. There was a contrivance for rendering the rope visible to the crew, and another to assist those on shore to descry the exact position of the ship in distress. The life-arrow, a cue-shaped stick of mahogany, with the thinner end projecting beyond the end of the barrel, is fired from an ordinary musket, and can carry 80 yards with a mackerel line attached. The best lines are those made of loosely-spun Italian hemp. There are several ways of arranging the line so that it may run out quickly without kinking or entangling. Dennett's faking-box for this purpose is now generally adopted. The sling life-buoy is employed in conjunction with the rocket-apparatus. It is popularly known as the breeches buoy (q.v.).

In the United States the mortar is in general use at life-saving stations. At each station a cart is kept always ready packed with all the requisites for the rocket apparatus, and can thus be despatched at once on any emergency. Care is taken that the supplies are regularly renewed before the old are exhausted.

Life-saving Guns. See LIFE-ROCKETS.

Life-saving Service, United States, an important and effective branch of the public service, under the direction of the Treasury Department. The present system was inaugurated in 1871, by the present general superintendent, Sumner I. Kimball, then chief of the Revenue Cutter Service. In June 1878, by act of Congress, it was organized into a separate bureau. The service extends to the coasts of the Atlantic and Pacific, the Gulf of Mexico, and the Great Lakes.

The first life-saving stations in the United States were established by the Massachusetts Humane Society at Lovell's Island and Cohasset. All efforts for saving life and property in cases of shipwreck were made by this society till 1837, when the President of the United States was authorized to employ ships to cruise along the shores and render assistance to distressed navigators. William A. Newell, afterward governor of New Jersey, witnessed a fearful shipwreck off Barnegat Island in which many bodies were washed ashore, and was so impressed by the sight that when he was elected to Congress in 1848 he introduced a bill for the relief of shipwrecked persons. The result of the passage of this bill was the placing of a few life-saving stations between Sandy Hook and Little Egg Harbor, N. J., and a little later a few stations were established on the coast of Long Island. Volunteer crews were depended upon at all the stations until the introduction of the splendid system which now extends along the entire coast and lake lines of the United States.

In 1903 there were 273 stations, of which 196 were on the Atlantic and Gulf coasts, 60 on the Great Lakes, 16 on the Pacific, and one at the falls of the Ohio, Louisville, Ky. During the fiscal year ending 30 June 1903, there were 697 disasters to vessels, 57 of which were totally lost. Of the 4,337 persons involved, 24 were lost. The value of property involved was $9,051,150, of which $1,169,105 was lost.

There are 13 districts in the service, over each of which is a district superintendent. There is also an inspector of life-saving stations at large, and in each district an assistant inspector, all being officers detailed from the Revenue Cutter Service. The business of the assistant inspectors is to look after the buildings, apparatus, drilling of the crews, etc., of their respective districts. Each station has a keeper who has six or seven surfmen under him. The keepers are all made inspectors of customs and so have legal custody of all property washed or brought on shore. The stations, generally two-story buildings of six or seven rooms, are built at irregular intervals along the shore from 3 to 20 miles apart, according to the frequency with which vessels approach the land in their course. They are connected by telephones wherever practicable, and the distances between them are patroled day and night. Each patrol carries a red Coston signal light, which he burns when a vessel is discovered in distress. On the Great Lakes the life-saving stations are kept open from the beginning of navigation in April to its close in December. On the Atlantic coast they are open from 1 August to 1 June, while on the Pacific coast they are open the year round. Each station is equipped with the life-boat (q.v.), guns, mortars, breeches buoys, and other devices for saving life and property.

HORACE L. PIPER,
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Liffey, lĭf'ĭ, Ireland, a river which rises in county Wicklow, flows west into Kildare, then turns northeast and passes through the county and city of Dublin into the Irish Sea after a course of 50 miles.

Lig'ament, in anatomy, human and comparative, a band of white fibrous tissue which connects bones. To this class of tissue also belong the tendons or sinews of muscles, by which these structures are attached to the surfaces of bones. Ligaments differ from tendons in being of a stouter structure, and less liable to give way or to be ruptured. When ligaments break during life they seldom snap across or transversely, but generally tear in an irregular manner. Tendons, on the contrary, when subjected to great strains, break across. Ligaments possess little or no elasticity, and when stretched do not recover their resiliency. To the same class of structures as ligaments and tendons, the fasciæ or sheet-like bands of white fibrous tissue spread over muscles and regions also belong. Microscopically examined, both ligament and allied structures exhibit sets of fibres arranged in parallel bundles, imbedded among which little nucleated bodies known as connective-tissue corpuscles are seen. These latter are minute corpuscles of various shapes, and their function has been assumed to be that of ministering to the growth and nutrition of the fibres amidst which they are placed.

Ligao, lē-gä'ō, Philippines, a pueblo of the province of Albay, Luzon, situated near the Inaya River, 22 miles northwest of Albay, the provincial capital, on the main road. It is in one of the best hemp growing regions in the archipelago. Pop. 17,900.

Lig'ature, in surgery, a cord, thread, bandage, etc., by means of which structures are tied or bound. A ligature is used for tying a bleeding artery or other vessel; for tying the pedicle of a tumor to prevent effusion of blood or other fluid after its removal; it may be tightly fastened round the base of a tumor to cause its subsequent removal by arrest of its blood-supply and consequent death. Thread of silk or hemp was formerly employed. Ligatures of animal material are now mostly used, catgut, silkworm gut, etc., also those of silver wire, and they are usually rendered antiseptic by steeping in carbolic acid or other antiseptic solution.

Ligature. See MONOGRAM.

Light. The word light is used in two distinct senses, namely, to designate the sensation which is characteristic of the organ of vision (q.v.), and also as a name for the usual cause of that sensation. This double meaning of the word would result in little inconvenience if there were always a definite relation between the sensation and its cause; but this is far from being true. For example, when we speak of white light, we may mean a sensation which is perfectly definite and familiar to all persons of normal vision, or we may mean that form of energy which can give rise to such a sensation. In this second sense the term is wholly indefinite, since there is an infinite variety of forms of energy which may give rise to the sensation of whiteness. The difficulty, which is a serious one in scientific language, may be avoided by restricting the use of the word to one of its significations, preferably to that of sensation, after the analogy of the use of the word sound. But such a restriction would not be in accordance with well-established usage, and it would necessitate the frequent employment of awkward circumlocutions. Another means of avoiding confusion is to so divide the subjects treated that the sense in which the word is used is unmistakable. This second method has the advantage of conciseness as well as that of being in accordance with the usage of most writers. The present article treats of light as a phenomenon of wave motion, wholly independent of the sense organ which betrays its existence to us. In it the eye is regarded as a simple optical instrument, quite like the photographic camera. This limitation admits of a satisfactory definition of the terms «white light,» «yellow light,» etc. Thus, by the former term we mean such waves as are emitted by a solid body at a very high temperature, as, for example, the incandescent lime in the lime-light. Any other kinds of waves, even if indistinguishable from these by the unassisted eye, are not white light. Again, yellow light, green light, etc., are the simplest waves which excite in a normal retina the sensations yellow, green, etc.

Theories Concerning the Nature of Light.— It is now a little more than two centuries since the Dutch philosopher Huyghens published a paper in which he explained the familiar phenomena of light by waves in a medium that pervades all space and is called the luminiferous ether. His reasoning was so convincing, the explanations so simple, and the experiments supporting his views so apt, that except for the labors of the single philosopher then living who was greater than Huyghens himself, they could hardly have failed to receive at an early day the universal acceptance which they now command. Nine years earlier, in 1669, Newton had commenced his labors in the field of optics, by which, largely on account of fame and authority won in the domain of mechanics and astronomy, he established a theory of light which remained almost unquestioned for nearly a century and a half. Newton supposed light to consist in extremely small particles of matter projected from shining bodies with enormous velocities. We now know that this hypothesis was not only less fruitful than that of Huyghens, but, even with the comparatively limited range of optical phenomena known to Newton and his contemporaries, was also less probable.

According to this view of Newton, visual sensations are produced by the impact upon the retina of minute corpuscles emitted from luminous bodies which pass freely through transparent substances, differences of color being due to differing size in these small bodies. When these corpuscles approach the boundary of an optically denser medium, they are subjected to a force of attraction which causes them to deviate from their otherwise rectilinear paths. This is the explanation of the phenomenon of refraction. The secondary phenomenon of dispersion was very simple and naturally explained by an assumption that this attracting force varies with differing size. Singularly enough, the explanation of one of the most common phenomena, that of partial reflection at the boundary of a transparent medium, offered formidable difficulties: How is an attraction which is necessary to account for refraction also to act as an apparent repulsion for those corpuscles which are thrown back from the surface in reflection? This is a difficulty which the advocates of the Newtonian theory have never been able to meet in a satisfactory manner.

When Newton attempted to extend his theory to the explanation of the colors of thin plates, a subject which he was the first to investigate in a scientific manner, it was found even less satisfactory. He was obliged to supplement it with the highly artificial hypothesis that the corpuscles experience periodic changes in the ease with which they enter a refracting body. Even this addition to the theory fails to yield more than a rough approximation to an explanation of the phenomena, since the blackness of the central spot in Newton's rings apparatus, when the plates are brought into contact, is in contradiction with it. But it was only on account of a subsequently accumulated knowledge of optical phenomena which refused to adjust themselves to this theory, no matter how it might be modified, that its final overthrow came about. This not only required a long time, but also a champion of transcendent power to break with a system which had the force of tradition as well as the authority of the greatest of all philosophers to support it.

From 1704, the date of the publication of Newton's Optics, until 1815, the corpuscular theory was hardly questioned; at any rate, it reigned supreme in all treatises on light, and it was questioned only by a very few investigators who failed to acquire an influence that was anywhere decisive. In the latter year Augustin Fresnel, a young French government engineer, entered upon a career of scientific activity which proved of almost unprecedented brilliancy and success. This, as far as it bears upon the purely physical theory of light, may be regarded as completed in 1826. Beginning with a highly philosophical criticism of some of the accepted doctrines of optics, supported by the most apt appeals to ingenious experiments, he quickly extended his investigations until he embraced nearly all phenomena of light known to his contemporaries; and this with such success that he not only established as beyond question the essential truth of a wave theory but brought it to so high a degree of completion that his views were long supposed to be practically final. On account of the importance of this work of Fresnel in the history of physical science of the past century, it is well worth while to briefly review its character.

The phenomena of diffraction first engaged the attention of Fresnel. It had long been known that the shadow of an opaque body cast by a point-source of light is somewhat different from what would be supposed from simple geometrical considerations, the difference consisting chiefly in an encroachment of the light upon the borders of the shadow. Newton, who called this phenomenon inflection, attributed it to an attractive force exerted by the opaque body upon the corpuscles while in its neighborhood, thus causing an inbending of their paths. Fresnel showed that this explanation was quite untenable, since the inflection caused by the back of a razor is exactly the same as that caused by the edge, although in the former case it is manifest that the time during which the corpuscles are subject to the deflecting force is far greater than in the latter. By similar appeals to ingenious crucial experiments he demonstrated that none of the current theories was sound; but far from resting here, he showed that all the observed phenomena could be perfectly accounted for in the undulatory theory of light, by an application of the principle of Huyghens. Extending this principle, so fertile in his hands, to wider fields in the domain of optics, he found in every case that the new method was adequate to yielding perfectly satisfactory results. With quite simple and natural hypotheses as to the conditions which must exist at the common boundary of two transparent media, he was even able to deduce quantitative laws governing the phenomena of reflection and refraction, which accord surprisingly well with experiments devised to test them.

A few years before the commencement of Fresnel's activities, Malus, while looking through a double-image prism, observed that the two images of a distant window which happened to be in such a position as to reflect light strongly to his eye, were quite different in brightness, and that under some conditions one image might entirely disappear. Further study showed that all ordinary transparent substances were capable of thus modifying light by reflection, and that the modification is complete at an angle which is simply related to the refractive index; moreover, that under the latter conditions the light would be transmitted through doubly refracting crystals in certain directions without bifurcation. Such modified light is called polarized light, and the phenomena thus briefly described are two of the simplest of an enormously extensive class, many of which are of extraordinary beauty. This discovery and those which quickly followed in the same field presented a host of new and difficult problems to physicists. Of the many active and able workers in this domain Fresnel was easily the leader. In a very few years he had proposed and developed a general theory of light which embraced these new phenomena and which stood almost unquestioned until our own day; and even now the most essential principles of his theory are wholly unshaken. In its barest outlines the theory may be described as follows: Fresnel assumes that the motion of the particles which constitutes the vibrations of light is always in a direction at right angles to the line of propagation of the waves. When the paths of the particles are quite irregular or without order, the light is ordinary light; but when the paths are similar, whether straight lines, ellipses with their axes parallel, or circles with a common direction of motion, the light is said to be polarized. From this simple hypothesis he succeeded in erecting an extraordinary structure which harmonized and explained nearly every known phenomenon of light in a manner that until the most recent times practically withstood all destructive criticism. Even recent achievements in this field of science have been supplementary to, rather than subversive of, Fresnel's general work. Of the phenomena known to his contemporaries, that of dispersion alone was unconsidered by him, a phenomenon which obviously depends upon the ultimate molecular structure of the refracting substance and which has recently been reduced to comparatively simple laws. This great work of Fresnel was looked upon, as indeed it well deserves to be, as one of the greatest monuments to the human understanding — comparable to Newton's doctrine of universal gravitation — and it long remained of almost unquestioned authority. Ultimately, however, one of its fundamental postulates, namely, that the vibrations are always at right angles to the direction of the motion of the light, began to give rise to difficulties. The fact also that the theory could not determine specifically whether the direction of vibration of plane polarized light is in the plane of polarization or perpendicular to it was not only a manifest incompleteness, but it was a constant stimulus to a critical inspection of its premises. The more these points were studied the more insoluble the difficulties apeared, until there came to be a tolerably widespread belief that the theory was not only incomplete, but that in some way it must be essentially in error. To acquire a notion of what modern science has done to clear up these points, we must first review a class of phenomena which seem to be totally unconnected with optics, but which in the end will afford a very remarkable example of the tendency of all science toward unity.

In 1845 Faraday discovered that if polarized light is passed through a transparent substance in a magnetic field and in the direction of the field, the plane of polarization is rotated. The amount of rotation for a given substance is found to be proportional to the strength of the magnetic field and to the length of the path in the material. As many substances, such as turpentine, a solution of common sugar, quartz crystals in the direction of their crystalline axes, etc., present us with a similar fact, this would not be so surprising save for a remarkable difference in the two cases which may be thus described: When the plane of polarization is rotated by passing through a sugar solution or a similar body, and the transmitted light is reflected back upon its course so as to retrace its path, it is found that the original angle of polarization is perfectly restored by a precisely equal rotation in the opposite direction in the return; but a similar experiment upon the body giving the magnetic rotation shows a doubled change of angle. This indicates that, although in the first case we must explain the rotation by the molecular constitution of the material, we are not permitted to suppose that the magnetic field has produced a similar molecular structure in the second case, since the rotation is constant in direction irrespective of the direction of motion of the light. Of course, from the known nature of magnetism, this is equivalent to asserting that there must be some relation between light and electricity. But this is not the most obvious connection between these two classes of phenomena, for as we now know, the earliest division of materials in accordance with their electrical properties involved a classification according to their most characteristic optical properties also. Thus all conductors of electricity, excepting only those liquids which undergo a chemical decomposition when they transmit an electrical current, and therefore belong to an obviously different class, are extremely opaque to light; conversely, all substances which are good insulators are also transparent to light, at least to an extent which would make a sheet a few hundred-thousandths of an inch in thickness appear perfectly transparent, although such a sheet of metal or similar conductor would not differ greatly in opacity from a thick plate. An excellent illustration of the generality of this law is furnished by the element carbon, which in the dense opaque form — like graphite, for example — is a very good conductor of electricity, but in the form of the transparent diamond is an insulator.

Before the middle of the 19th century two methods of measuring electrical magnitudes had been developed; one of these is based upon the repulsion which exists between two electrically charged bodies, and the other upon the repulsion which exists between two similar magnet poles. Elaborate and repeated investigations have demonstrated that if a given electrical magnitude is measured according to one of these systems, and the value thus found is compared to a measurement of the same quantity in the other system, the ratio involves a velocity only. This statement is quite independent of the kind of magnitude chosen for the experiment. Within the limit imposed by unavoidable errors of observation the value of this velocity always appears to be the same as the velocity of light.

Here, therefore, are three distinct relations between light and electricity, which have long been known and to no one of which it is possible to attach any *a priori* reason. It was left to Maxwell to illuminate this obscure field. His long and successful investigations in electricity and magnetism, especially his efforts to reduce Faraday's brilliant discoveries to correlation and to a consistent scientific statement, led him to the conclusion that light itself consists of electrical vibrations. He attempted to test the validity of this hypothesis by every means at his command. For example, according to his theory a non-magnetic substance ought to have a dielectric constant, or what Faraday named its specific inductive capacity, equal to the square of its index of refraction. This indicated relation was found to hold with all expected precision in some cases, but to be widely removed from the truth in others. Again, since, according to the theory, only those substances are transparent which will offer a resistance to the motion of electricity within them analogous to elastic reaction, there ought to be a determinable relation between electrical conductivity and opacity. Maxwell attempted to find this relation in the case of gold-leaf, which is sufficiently thin to transmit a measurable portion of the light falling upon it. Notwithstanding that the discrepancy was here found disappointingly great, the gradual accumulation of knowledge of the more recondite phenomena of the electrical field had led the great majority of physicists to the conclusion that Maxwell's theory was at least a close approximation to the truth, and accordingly one of the most brilliant discoveries of the 19th century. This may be regarded as a fair statement of the attitude of the world of science in 1888, when Hertz, a German physicist, made a series of remarkable experiments which have eliminated all possible doubt as to the essential verity of Maxwell's theory of light. Fortunately it is not difficult for us to gain a sufficient knowledge of the character of these experiments to make clear their general bearing.

It had long been known that a Leyden jar suddenly discharged through a thick wire gives rise to an oscillatory current of very brief duration, and that in certain simple cases the period of the oscillations can be calculated with considerable accuracy. Hertz recognized that during the time of discharge such an electrical circuit must be a source of oscillatory changes in the magnetic field, which, if the views of Maxwell are in accordance with fact, should be propagated through space with the velocity of light. Although it is difficult, if not quite impossible, to measure directly this velocity, if one knows the wave-length and the period it is perfectly easy to deduce the velocity from these two elements, since in its period every wave moves a distance equal to its own length. In these experiments the period was calculated from the elements of the electric circuit; it only remained therefore to determine the length of the waves. Hertz accomplished this in the following simple and ingenious manner: At a considerable distance from the source of the waves he placed a large sheet of metal perpendicular to its direction from the source. From this sheet the waves were returned upon themselves by reflection. Now, a well-known fact in wave motions is that when two systems of waves of like period are moving in opposite directions, they combine to form a system of standing waves of half the length of the free waves. The regions where motion is destroyed by this kind of interference are called nodes. Hertz demonstrated the existence and position of these nodes by means of an apparatus which possessed the same electrical period as the source. This apparatus he called a resonator. The value of the velocity of these waves deduced from his observations differs no more from the known velocity of light than would be expected from the unavoidable errors of observation; thus it complies with the requirements of Maxwell's theory. These waves, therefore, are shown to differ from light waves only in their enormously greater wave-lengths, and that they must be subject to all the established laws of optics which are independent of the length of the waves. The last conclusion was thoroughly tested by Hertz by a series of most interesting and convincing experiments. He found that strictly according to the laws of optics these waves are reflected from the surfaces of all bodies which conduct electricity; that they readily pass through substances which behave as insulators; and that in passing from one insulating medium to another the direction of propagation is altered in accordance with the law of sines. Further than this, he showed that such electrical waves admit of polarization, and they are therefore characterized by motions at right angles to the direction of propagation. During the time which has elapsed since these investigations a host of experimenters have improved the methods and apparatus of Hertz, and have largely extended the range of wave-lengths that can be observed. On the other hand, many investigators have been employed in the application of analysis to both the old and the new problems in optics. The difficulties which attach to Fresnel's mode of regarding the optical phenomena of crystalline media are found to disappear, and all the complex phenomena of light admit of explanation from a consistent body of premises.

Reflection — Refraction — Dispersion.—When light waves originating at a point fall upon a surface separating two media, the system of waves is broken up into two systems, one of which remains in the first medium, though moving in a changed direction, and the other entering the second medium. The former system constitutes reflected light, and the latter, also in general changed in direction, is called refracted light. If the bounding surface is smooth the phenomena of reflection and of refraction are regular and the modified paths of the light can be calculated. The total intensity of the reflected light varies greatly with the nature of the media on either side the interface and also upon the angle at which the wave surfaces meet this surface. If we consider only the case of the first medium being air, we may describe two general cases of interest. (1) If the second medium is a transparent substance, like most liquids, ice, glass, etc., the reflected light is ordinarily of small intensity as compared to the incident light, but increases with increasing angle of incidence, until, as this angle approaches 90°, the rate of increase becomes very great. (2) If the second medium is a metal the reflected light is ordinarily a large portion of the whole, but its intensity does not vary greatly with the angle of incidence. Turning now to a consideration of the light which passes the interface and enters the second medium we find that in some substances these waves will go a great distance without notable diminution of intensity. Such substances are called transparent. In others, described as opaque, the light waves are converted into other forms of energy in longer or shorter distances, and are destroyed as light. In the case of metals and other good conductors of electricity this destruction follows a penetration of only a few millionths of an inch. The laws which determine the directions of the reflected and refracted light are simple. Calling the angles which the incident waves, the reflected waves, and the refracted waves, make with the surface separating the two media, the angles of incidence, of reflection, and of refraction, respectively, we have for the law of reflection the angle of reflection is equal to the angle of incidence, and for refraction, the sine of the angle of incidence divided by the sine of the angle of refraction is equal to the velocity of propagation of the waves in the first medium divided by the velocity in the second medium. These laws are not absolutely without geometrical ambiguity, but are made so by the addition that the change of direction in both cases is the least possible. If the refracted light is observed critically it will be found that the direction varies somewhat for lights of different colors, so that, if white light is incident, the light will be arranged in direction according to its component colors, the red being least changed, then yellow, green, blue, and, most of all, violet. This phenomenon is called dispersion. Since the maximum difference of deviation for small angles of incidence is never more than a small part of the whole — very few substances exhibiting a ratio greater than one twentieth — dispersion should be regarded as a secondary phenomenon of refraction.

Optical Images—Optical Instruments.—When light waves originating at a point are modified by one or more smooth surfaces — either by reflection, or refraction, or by a combination of the two — so that after these modifications they either pass through a new point or seem to do so, this new point is called the optical image of the first. To distinguish the cases of real points from those which only appear to be new centres the terms real image and virtual image are employed.

If an optical system can form an image, real or virtual, of a point, it follows from the law of continuity that it will also form simultaneous images of near lying points with a like degree of precision; the images of remoter points, however, may be, and in general will be, imperfect. The simplest of all optical systems is a plane mirror, and it is the only optical instrument which is absolutely perfect, provided only that it is not of too small dimensions. Such an instrument forms virtual images of all points in front of it, the sources and images being symmetrically placed with reference to the plane of the mirror. Bodies of transparent substances bounded by smooth curved surfaces, ordinarily spherical surfaces, are called lenses. Almost all optical instruments employ lenses for producing the required modification on transmitted light. If a lens increases the curvature of the wave-surfaces which pass through it — which in general requires the middle of the lens to be thicker than its periphery — it will produce real images of remote objects near its geometrical axis. Such a lens is called a *positive-lens.* A screen to receive the images and an opaque enclosure to shield it from extraneous light constitutes the important instrument known as the camera obscura. One of the earliest optical instruments invented, it has only been of importance since the discovery of a method of fixing the images a short time before the middle of the last century. The requirements of modern photography, especially the demand for brightness and wide angular extent in the images, have led to inventions of wonderfully complex camera lenses, so that ordinarily they are made of combinations of from four to ten different lenses, involving two or three different kinds of glass in their construction.

The eye is properly a camera obscura, in which images of objects neither too near the observer nor too far from the axis of vision are formed upon the retina as a screen. The most important difference between the eye and the photographic camera lies in the fact that the interior of the eye is filled with a substance optically different from air, which introduces some remarkable modifications in the phenomena of vision. These may be ignored in this casual review of the construction and function of optical instruments.

In almost all optical systems, excepting the camera obscura, the eye is a necessary part in use, and it is therefore convenient to specify the conditions under which distinct vision is possible. To a normal eye, any object very near the axis of vision can be distinctly seen if it lies at a distance comprised between five or six inches for a nearer limit and infinity for the farther. Thus, the moon and a printed page held at the customary distance for reading can be seen equally distinctly. We shall assume a distance of 10 inches as a standard of comparison.

Microscope — Telescope.—If a small object be brought quite close to the eye it will appear larger, but when too close vision will be indistinct. This is because the refractive power of the eye is insufficient to cause the light waves to form new centres at the retina; but if the refractive power of the eye be suitably increased by the aid of a positive lens placed between it and the object, vision is rendered distinct with the increased apparent size. A lens so used is called a simple microscope and the ratio of the apparent diameter of the object to that which it would have at the conventional distance of 10 inches is called the magnifying power of the microscope. Since nature presents us with innumerable examples of such microscopes in small drops of water, of transparent resins, etc., the phenomenon has doubtless been known since prehistoric times, and we have the best of reasons for believing that some of the artisans of antiquity employed magnifiers as aids in their work.

There is no theoretical limit to the magnification attainable with simple microscopes except that set by the nature of light itself, but very high powers demand inconveniently small lenses and such close approximations to the eye that illumination of the object becomes difficult. These difficulties can be greatly reduced by employing two systems of positive lenses, one of which serves to form a *real* and enlarged image of the object, while the other is a simple microscope used to observe the real image quite as if it were the object itself. The former system is called the objective, or object-glass, and the latter the ocular, or eyepiece. The instrument thus constituted is called the compound microscope, and its magnifying power is equal to the product of that of the objective into that of the ocular. The compound microscope was invented about the middle of the 17th century, but it was not perfected so as to be of real value as an instrument for scientific research until after the second decade of the 19th.

If a lens, or lens system, is employed to form a real image of a distant object and this image be viewed through a microscope, the combination forms a telescope. Since the real image is in general inverted, the object appears inverted to the observer if he employs a simple magnifier as an ocular, but it appears erect if the ocular is a compound microscope. The inverting telescope is optically superior and is universally used for astronomical observations, but for terrestrial observations the second type is ordinarily preferred, which, when it is desired to distinguish it by a name, is called a terrestrial telescope, or a spy-glass. The terms objective and ocular are also applied to the two lens systems in the telescope.

Since concave mirrors can also produce real images of distant objects they may be used in place of the objective. Such instruments are called reflecting telescopes; they have been very extensively used for astronomical purposes in the past.

Achromatism — Achromatic Combinations.— Newton was led by his experiments to conclude that the secondary phenomenon of dispersion bears a constant ratio to the refraction. It follows from this that a separation of composite light into colors is the inevitable concomitant of change of direction by refraction, and that this imposes a somewhat narrow limit upon the power of all optical instruments involving refraction. This belief led him to invent the reflecting telescope, which remained the leading form for astronomical purposes for more than a century. About the middle of the 18th century, however, Dolland found that Newton's conclusion was founded upon too limited a range of experiment and showed that it is possible, by a combination of two or more materials, to secure a change of direction of light by refraction with little or no evident dispersion. Thus, he found that a prism of crown glass, say of 10°, combined with a prism of flint glass of 5°, turned in an opposite direction, would yield a deviation nearly as great as a prism of crown of 5° and without the colors of dispersion. Such a combination is called an achromatic combination, and a pair of lenses similarly combined to give colorless images, is called an achromatic lens. All refined optical instruments utilize this invention of Dolland. In telescopes the objective ordinarily consists of two members only, a positive crown lens combined with a negative (diverging) flint lens; in microscope objectives there are rarely less than four lenses, and sometimes, in the case of very high powers, not less than ten.

Interference Phenomena — Diffraction.—That light is in fact some form of wave-motion does not appear from the phenomena of reflection and refraction in their commoner manifestations, although if the acting surfaces are made very small there are deviations from the simple laws given above which inevitably lead to a wave theory for an adequate explanation. For the present purposes it seems far better to describe some of the simpler and easily produced phenomena which demonstrate the wave-motion.

One of the most striking properties of all varieties of waves is their propagation independently of the state of motion of the medium in which they exist, for example, water waves of all possible lengths and having all possible directions of propagation may coexist on a single surface of water. In familiar acoustic phenomena we have excellent analogies which will greatly help in the comprehending of the less familiar optical phenomena. If two tuning-forks of exactly the same pitch be sounded together it is found that there are regions where all evidence of sound vanishes, provided that the forks are equally loud. These regions of silence are those where the maximum of density due to one set of waves corresponds with the minimum of the other set, and they are so simply related to the positions of the two forks that having established their places, it is easy to deduce from the geometrical relations the length of the waves. Could we get two sources of light which emitted waves exactly alike, there should be corresponding regions where illumination from the two sources would be wanting, provided that light is in fact produced by a wave-motion. Since, however, the ultimate sources of light are the molecules of luminous bodies and we are unable to control such small bodies, so simple a test is impossible; but a perfect optical image of a source is exactly like the source itself, hence, if light is allowed to fall upon a screen and a portion of the same radiation is reflected by a mirror upon the screen, the conditions for interference are met. The experiment is a delicate one and liable to escape observation, only, however, because of the shortness of the waves. Fresnel tried the experiment, not only by using two mirrors, enclosing an angle a very little less than 180°, but also by using two prisms of very small angle, with complete success. The advantage of using a pair is obvious when similarity of the two sources — here two virtual images of the same source — is considered. His measurements showed that the waves which are found in ordinary white light have all lengths between those of $\frac{1}{33000}$ and $\frac{1}{66000}$ of an inch, the former being that of the extreme red of the prismatic spectrum, and the latter of the extreme violet. The mean value for white light may be taken as $\frac{1}{45000}$ of an inch.

A much easier, though less simple, method of exhibiting interference phenomena is the following: If a hole, less than $\frac{1}{50}$ of an inch in diameter, be pierced in a piece of paper, a distant bright point, such as an arc light or the bright point of a mercury thermometer-bulb in sunshine, will appear to an eye looking through the hole as a disk surrounded by one or more concentric rings. If now a second similar hole be made within less than $\frac{1}{20}$ of an inch from the other and the experiment be repeated, the disk will appear brighter and traversed by a series of dark lines perpendicular to the direction of a line joining the two holes. These dark lines mark the regions of complete interference and are exactly like the dark bands produced by Fresnel's method. The fact that the point-source of light appears as a disk of appreciable magnitude is also explicable by the fact that light is a wave-motion. Broadly stated the condition is this: if light consists of waves, we ought not to expect that the laws of reflection and of refraction will hold unmodified when the acting surfaces are no longer large with respect to the length of a light-wave. These deviations from the laws are called diffraction.

Since most of the light with which we ordinarily experiment is composite, that is, made up of a combination of many different wave-lengths, the places of complete destruction of illumination differ for differing wave-lengths. Such phenomena are therefore generally, sometimes splendidly, colored. Familiar cases of simple interference are presented by thin reflecting plates, such as soap-films, rifts in transparent media, as in precious opal, etc. In these cases we have the two sources produced by reflection from the two sides of the plates, and the phenomena are generally known as the colors of thin plates, first studied by Newton.

Diffraction phenomena are even more commonly seen. The peculiar lustre of satin spar, of the gems known as cat's-eye, and of the star sapphire, find their explanation here. The iridescence of mother-of-pearl and of certain feathers, and the brilliant colored pattern seen when an electric arc light is viewed through a fine and uniform fabric, like silk or the web of many feathers, are diffraction phenomena of greater regularity than the former group.

Optical Phenomena of the Atmosphere.— Of the many optical phenomena which belong either to the air as a transparent body or because of foreign bodies temporarily suspended in it, mirages, coronas, rainbows, and halos are among the most striking. The refractive power of the air increases with its density, and, as this is increased both by pressure and by lowering of temperature, there results varying effects of refraction. With the normal condition of the air, in which the density decreases in a geometrical ratio as we rise above the surface of the earth, the only very obvious effect is to prolong the length of the day to twice the time which it requires the sun to sink at the horizon by its own diameter. Atmospheric dispersion is also present, but is not sufficiently marked to be detected by the unaided eye, although conspicuous enough with a telescope under favorable conditions. The scintillation of the stars, however, is a direct effect of atmospheric dispersion.

In the not infrequent cases when the air departs widely from the normal law of continuous decrease of temperature with increasing height above the surface of the earth, the paths of the light waves which are nearly horizontal may change the direction of curvature between the object and the observer, in other words, may have points of inflection. In low latitudes the prevailing condition, when such abnormal refraction may be observed, corresponds to a lower layer of air at a higher temperature than that immediately above. In such cases distant objects near the horizon appear lifted above their real positions and portions of these much elongated vertically. A further development shows inverted images, generally without much distortion, underneath the raised images. Over sun-heated plains the inverted image is that of a portion of the sky, whence the effect of a sheet of water between the observer and the horizon. In high latitudes it is sometimes possible to find the condition of a layer of much cooler air in contact with sheets of ice or of cold water, in which case the inverted image is seen above the erect image. These phenomena are known under the name of mirage.

When the atmosphere is not quite clear one may sometimes see colored circles concentric with the sun or moon, generally not more than four or five times the diameter of the sun, and invariably having the inner edge blue. Such circles are called coronas. They are diffraction phenomena produced by very small spherical drops of water suspended in the air, and their diameters are in an inverse ratio to the diameter of the drops to which they are due. The only necessary conditions for well developed coronas are smallness and general uniformity of size in the drops.

When sun-light falls on drops of water which are not small compared to the length of a light wave, an entirely different phenomenon, involving reflection, refraction and dispersion, results. It can be shown that, when flat wave-surfaces of light enter a sphere of water, there are two cases in which a portion of the wave emerges from the drop still nearly flat, and that in these directions, therefore, the light will be transmitted with relatively great intensity. The first case corresponds to refractions at entrance and emergence with a single interior reflection; and the second case to the two refractions separated by two interior reflections. The total change of the direction of the light in the former case is 138°, and in the latter, 231°. It, therefore, follows that all drops at these two angular distances from the sun should appear relatively bright, in other words, that opposite to the sun there should appear two concentric circles under proper conditions of illumination, one, much the brighter of the two, of 42° radius, and the other of —51° radius. The secondary phenomenon of dispersion causes these angles to vary continuously for different wave-lengths, hence the circular arcs, constituting the double rainbow when perfectly developed, appear as bands of prismatic colors. It is not difficult to see that the primary bow, often the only one which can be traced, must be red on the outer border, whence we conclude from the algebraic sign attached to its radius, that the secondary bow should present the red border on the inner margin.

When the temperature is low, water cannot exist in the form of drops, but only in that of snow crystals and of a perfectly transparent vapor. On those occasions when there are numerous ice crystals of very regular form suspended in the air and illuminated by the sun or the moon, we may see one or more of a series of highly complicated phenomena which bear the names of halos, parhelia, sun-dogs, etc. A bare description of all the features which have been observed and recorded would demand far more space than is available; only the most common ones can be noted here. The simplest form of ice crystals, and the only form which is necessary to produce all the known forms of halos, is that of a right hexagonal prism. Such a body supplies two refracting angles, namely, that of 60° contained between two alternate faces of the prism, and that of 90° embraced between each of these faces and a base. As light traversing a 60° prism of ice has a minimum deviation of 22°, if there are present a sufficient number of such prisms between the sun or moon and the observer, the luminous body would seem to be surrounded by a concentric circle of 22° radius, having, on account of the secondary effect of dispersion, a red inner margin and a pale bluish outer one. Similarly the rectangular edges would give rise to a colored circle of 44° radius. The smaller circle can be seen very frequently — perhaps on sixty to eighty days a year in our latitude — while the 44° circle is rarely seen.

When the length and width of a small hexagonal prism differ greatly, it will not remain while falling through quiescent air in a purely chance position, but it will set itself more or less perfectly in a definite position with respect to a vertical. Thus a flat prism will fall with its base horizontal, and an elongated crystal will maintain its axis nearly horizontal. This peculiarity in falling crystals produces a large number of features in complicated halos which are generally recognizable because they are all symmetrical with respect to a vertical circle passing through the sun. Some of these are comparable with the most brilliant rainbows in their coloring. The most familiar of this class of phenomena are the two bright prismatic spots to the right and left of the sun respectively, having the same altitude as the sun and their red side turned toward the sun. When the sun is very low they are 22° distant and appear merely as bright portions of the inner halo, but as the altitude of the sun increases they increase their angular distances, and above a moderate altitude they disappear. These spots are called parhelia, or sun-dogs; they are sometimes the only feature of the halo visible and are by no means infrequent. See also CAMERA; ELECTRICITY; ELECTRIC LIGHT; MICROSCOPE; TELESCOPE; VISION.

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Light, Therapeutics of. In medicine light has been used from the earliest times, and the therapeutic application of sunlight is an empirical mode of treatment, in many diseases, which has been handed down through generations. Only in recent years, however, have more definite forms of light-therapeutics been applied, but with the discovery of the X-ray by Röntgen began a new era. The reaction of the human body to different forms of light is very striking, and however various the sources of light, the mode of reaction is often marvelously similar. Thus, the surface capillaries of the skin are dilated, there is exudation of serum into the subcutaneous tissues, and the nerve-endings are stimulated. The results of the application of light widely vary, the variations depending upon the area exposed and the part affected. There is one form of sunburn resulting from direct action of the rays of the sun, and similar burnings have been produced by X-rays and by means of radio-active substances.

At the present time sunlight is used as a general tonic, and as a special tonic to the skin, while as a disinfectant its powers are systematically applied. Modified electric light, X-rays, and radio-active substances are now extensively employed in the treatment of certain forms of new growths of the skin and of the interior body. Lupus is readily cured by means of the Finsen light, and superficial forms of cancer of the skin, and even cancers of internal organs have been cured by means of the X-ray. The X-ray, moreover, produces marked stimulation of the skin, with sweating and at times loss of hair, so that it may be used as a depilatory agent. It is not unlikely that the applications of the X-ray and of radio-active bodies, such as radium, polonium, uranium, etc., will within a few years undergo profound modifications. The study of scientific radiotherapy is only in its infancy. See RADIUM; X-RAY.

Light of Asia, The, a noted epic poem by Sir Edwin Arnold, published in 1878 in eight books. It attracted general attention at its first appearance and familiarized the average reader with the teachings of Buddha. The poem is smoothly written, with not a little beauty of description and movement, but is not the great work its early admirers imagined. The poem has been translated into many languages.

Light That Failed, The, a novelette by Rudyard Kipling (q.v.), published in 1890; the first long story written by this author. The story was dramatized and received its first presentation in 1903, Forbes Robertson appearing in the title-role.

Light-Horse Harry. See LEE, HENRY.

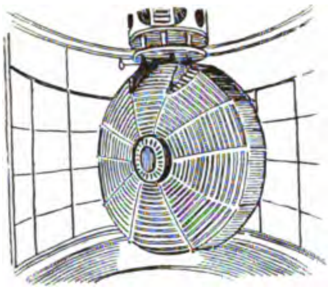
Lighter, a flat boat or barge for transporting merchandise on rivers and canals, and to and from vessels moored in a stream, or where they cannot be laden from or discharged on to a wharf or pier alongside.

Lighthouse, a structure on some conspicuous point of seashore, island or rock, or on the bank of rivers and lakes, from which a light is exhibited at night as a guide to mariners. Lighthouses are generally placed on salient points, each requiring structures specially designed to meet the exigencies of varied sites. When placed on headlands or large islands lighthouses are very much alike in general features, the differences being mainly in the height of the towers, depending on the distance at which the light requires to be seen, and the lighting apparatus. Towers erected on isolated wave-swept rocks in the open sea, such as the Eddystone (now superseded by Sir James Douglass' tower), the Bell Rock, Skerryvore, and Chickens Rock lighthouses, in Great Britain; the Minot's Ledge and Spectacle Reef in the United States, and Bréhat in France, are triumphs of engineering.

History.— The history of lighthouse building and illumination may be said to extend over a period of more than 2,000 years; but the regularly organized life-preserving system of modern lighthouse engineering goes back very little further than the beginning of the 19th century. None of the early lighthouse buildings now exist. The Pharos of Alexandria (331 B.C.) gave its name to its successors. The Romans built lighthouses at Ostia, Ravenna, Puteoli, and other ports. The Phœnician Pharos at Coruña was repaired during the reign of the Emperor Trajan, was re-established as a lighthouse about 1634, and in 1847 had a dioptric apparatus placed in it. On the cliff at Boulogne there are the remains of a lighthouse ascribed to Caligula (40 A.D.), and at Dover there are remains of another Roman Pharos. Until the end of the 18th century the lighthouses of Great Britain and the United States were few in number, and of an inferior description in the great essential of a lighthouse, namely, sending the greatest number of rays of light toward the horizon. Many of the public lights in England were private property, as was also the case with the Isle of May in Scotland, the patent for which was ratified in 1641. There were only 25 lighthouse stations and six floating lights in England at the beginning of the 19th century. The coast and harbor lights in Great Britain and Ireland are now upward of 880 in number. In the United States of America the first act of Congress relating to lighthouses was passed in 1789, and there are now in American waters over 3,000 lights and light-ships and 246 fog-signals.

The early lighthouse towers had on their summits grates or chauffers, in which billets of wood or coal were burned, but though expensive to maintain — some of them using 400 tons

LIGHTHOUSE.



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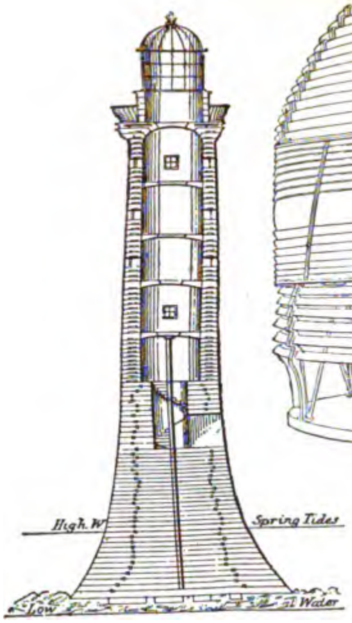

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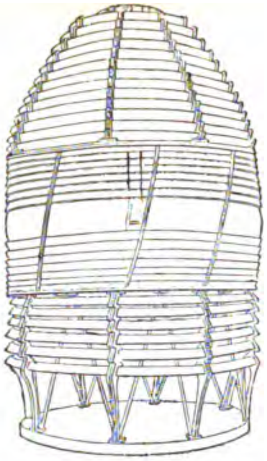

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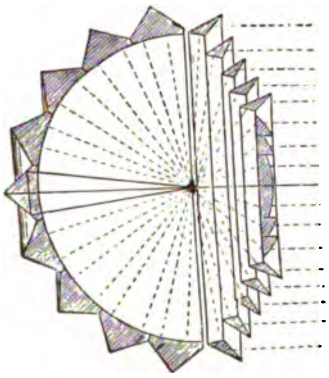

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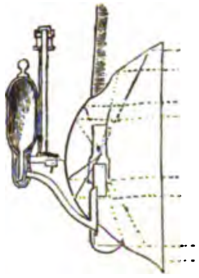

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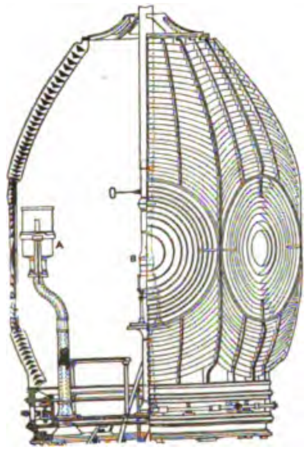

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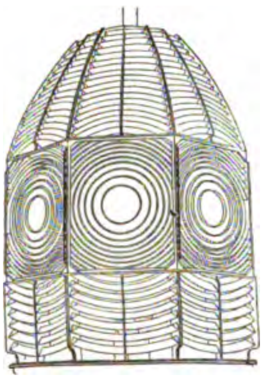

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1. New revolving light, Barnegat, N. J.
2. Holophotal univalve apparatus with dioptric mirror.
3. Sectional plan of Bell Rock Tower.
4. Fixed dioptric light.
5. Parabolic reflector with oil-fountain lamp.
6. Elevation of triple-flashing apparatus.

of coal yearly — were uncertain in their appearance, varying with the ever-changing character of the atmosphere. Such coal-lights survived in Scotland till 1816, in England till 1822, and on the Baltic till 1846.

Construction.— The difficulties of building are very great, as may be judged from the following facts: Winstanley's Eddystone took four years to erect, and was finally swept away; Rudyerd's and also Smeaton's Eddystones took each three years, the Bell Rock took four years, the Skerryvore five, and Dhuheartach three and a half, the great difficulty being to effect a landing of men and material. At Minot's Ledge, off the Massachusetts coast, General Alexander got only 30 hours of work in the first year, and 157 in the second, and the histories of the Bell Rock, Skerryvore, Dhuheartach, Chickens, Eddystone, and some others tell the same tale. The cost of lighthouses may vary much; for instance, the Bell Rock cost $310,000, Skerryvore, $430,000; Spectacle Reef, on Lake Huron, $300,000; and it will be easily seen that an ordinary land station, fully equipped, will cost much less — as a matter of fact, about $25,000 to $50,000. Light-vessels cost about $45,000.

These towers are constructed of steel, or hard stone, such as granite, or cement-concrete faced with hard stone, and of such a mass and strength as to prevent their being overturned or destroyed by the waves. A typical stone lighthouse is built of granite, say 140 feet in height, with a diameter at the base of 42 feet and at the top of 16 feet, and contains 58,580 cubic feet, or about 4,308 tons of masonry. A staff of four light-keepers is attached to such rock lighthouses, three residing in the lighthouse and one on shore, the reliefs being fortnightly, so that each man has six weeks on the rock and two weeks ashore. At land lighthouse-stations, where women and children can be stationed, the keepers' families reside with them, and the staff consists of three men when there is a fog-signal, and two men when there is only the light to attend to. It is considered essential that a constant watch be kept in the light-room during darkness to ensure the proper exhibition of light.

Optical Apparatus.— The object of using optical apparatus in a lighthouse is to direct, as far as possible, all the rays of light that proceed from the *radiant,* or source of light, so as to be visible only on the sea between the near sea and the sea horizon. In the Eddystone lighthouse, up to the commencement of the 19th century, the lighting apparatus consisted of a chandelier of tallow candles, though parabolic reflectors made of facets of silvered glass mirror, set in a mould of plaster of Paris, were introduced in 1768 and used in several lighthouses, the effect of these reflectors being to concentrate and throw seaward the rays of light from a flat-wick lamp placed in the focus. At a later date reflectors composed of sheet copper, plated with silver and formed into a parabolic curve, were largely introduced and are still in use. These reflectors, where a fixed light was desired, were arranged in two tiers on a frame, as many as 26 being necessary to show a light of equal power all around the horizon, and in the case of flashing lights seven were grouped on each of four faces of a frame that was rotated by clockwork. This mode of lighting is termed *catoptric* or reflecting system. The method of building lenses of separate rings or prisms of glass, so as to form a larger lens than could be obtained from a mere bull's-eye formed of one piece of glass, was first adopted for lighthouses in 1822. For a fixed light the built-up lens was so arranged as to form a polygon with one burner in the focus, and for a flashing light annular lens panels were grouped round the one central burner and revolved by clockwork. In 1892 Charles A. Stevenson made the lenses spherical in form in the vertical plane, and in 1895, with great advantage to the power of the light, abolished the old section of the elements and gave them an equiangular section. This equiangular profile also permits of the refracting elements being extended to 80° of focal opening, and indeed farther, without loss of efficiency. The setting of lenses eccentrically has rendered possible a diminution in the diameter, and consequent saving in cost of lantern and tower. Besides the fixed-light apparatus and the lens panels many other forms of prisms for various purposes have been introduced. Thomas Stevenson's catadioptric mirror, formed of totally-reflecting prisms, and subsequently improved by James I. Chance, is largely used; and vertical straight prisms, placed in front of either fixed light or holophotal panels, are used to deviate the light azimuthally over particular arcs where the light is required. The desire to increase the power of the lights induced some lighthouse authorities to advocate the use of larger burners without increasing the focal distance of the apparatus, with the result that little advantage was gained, as most of the light was ex-focal. It was not, however, till 1885, that the first *hyper-radiant* lens was constructed, with the result that when tested it was found to produce a beam twice as intense as that from the previous lenses with the same large burners in the foci. This hyper-radiant lens is now largely used where great power is desired. See PLATE.

Radiants.— The radiants used in the focus of the apparatus in foreign lighthouses are generally 1-, 2-, 3-, 4-, 5-, 6-, or even 10-wick cylindrical paraffin burners, though gas burners, incandescent burners, and the electric light, both arc and incandescent, are also in use. The use of paraffin resulted in a large saving. The electric light is now generally used in the United States. The popular idea that the electric light is not so good in fog as oil or gas lights was confuted in 1885, when it was found that oil and gas were equally affected by atmospheric variations, that the electric arc light is absorbed more largely proportionately to its initial power by haze or fog than oil or gas lights, but that in all weathers and at all distances its penetrative power was found superior to the gas and oil lights, and that all three are nearly equally affected by rain. These results are confirmed by practical experience in our lighthouses.

Characteristics.— To enable the sailor to distinguish one lighthouse from another, lights in proximity to one another are arranged to exhibit different characters. The characters in common use are: fixed light; flashing light, showing one flash at regular intervals of a few seconds; group flashing lights, showing two or more flashes in quick succession, followed by a longer period of darkness than that which separates the flashes; occulting lights, which show a fixed light and are eclipsed for a few seconds at regular intervals. Colored lights, red and green, are also used with any of the foregoing characters to produce further distinctions, but in general only to mark danger arcs, or in conjunction with a white flash, as the tinted-glass shades interposed to produce the desired color seriously cut down the power of the light, and are not, unless of a very dark shade, easily distinguishable in foggy weather from a white light.

Machines.— To produce these various characters the lenses are placed on a carriage which revolves on conical rollers, or is floated in a mercury trough, and is driven round by clockwork actuated by a falling weight. The tendency has been in recent years to drive the apparatus faster, so as to make the period of phase of the light as short as possible. While this is a desirable object it involves at the same time shortening the duration of the flash on the eye of the sailor, to which there is obviously a limit, if distinct vision is to be obtained under practical conditions. A flash of about half a second in length is regarded as what should be aimed at. The light at Sandy Hook, N. J., is an example of the modern flashlight.

Lanterns.— The apparatus is placed in a glazed lantern erected on the top of the lighthouse tower. With the view of intercepting as little light as possible, the framing or sashes are made of as small sectional dimensions as is consistent with strength, and are made either diagonal, with diamond-shaped flat panes, or helical with curved panes. The upper part of the lantern is made dome-shaped with a ventilator to carry off the fumes from the lamp. The size of the lantern varies with that of the apparatus, the usual size for a first-class light being 12 feet in diameter and 10 feet height of glazing.

Lightships.— In certain situations, such as on rocks where there is not sufficient room to get a large enough base for a tower, or on sandbanks where the sand is liable to shift, it is impossible, except at a prohibitive cost, to erect towers to carry the light. In such situations recourse is had to mooring in the vicinity a vessel which carries the light on a mast. The light is generally shown from a lantern formed round the mast, and the apparatus consists of parabolic reflectors or small dioptric apparatus. These light-vessels have a crew consisting of a master, mate, and nine men.

Beacons and Buoys are used in situations where powerful lights, such as can be shown from lighthouses and lightships, are not necessary, and where the extinction of the light would cause inconvenience and not disaster, but where some guidance is desirable, as, for example, in narrow sounds, rivers, and estuaries. Beacons are now frequently lighted with small dioptric apparatus, the illuminant being either compressed oil-gas stored in a receiver, in which case they need no attention for six weeks, or with oil-burners, in which case they must be trimmed every three days. Buoys are made of various shapes to denote on which side of them the safe channel lies. Thus, can-shaped buoys, those with a flat top, are to be passed on the port hand, and conical shaped buoys on the starboard hand when the ship is going up an estuary or with the flood-tide, and vice versa. Spherical buoys denote a middle danger which may be passed on either hand. Buoys for particular places are further differentiated by color and top marks.

Fog-signals.— During the prevalence of fog and snowstorms the most powerful lights are obscured, and it becomes necessary to guide the mariner by sound signals. Hence a fog-signal has become a necessary adjunct of a fully-equipped lighthouse station. Various instruments, such as bells, gongs, guns, steam-whistles, explosive charges of tonite, reed trumpets, and sirens sounded by steam, electricity, or compressed air, are used. The most efficient and powerful fog-signal is the siren sounded by compressed air. In spite of the recent improvements in fog-signals they are undoubtedly the weak point in coast protection, as the exact direction from which a sound is coming is not easy to locate, and owing to the capricious and uncertain range at which sound can be heard.

Administration.— In Great Britain, the Trinity House of London, the Irish Lighthouse Board, and the Northern Lighthouse Board are the lighthouse authorities. The two last named were not constituted till 1786, but the Trinity House may be said to have originated in 1514. The French Commission des Phares was constituted in 1792, and remodeled in 1811; the United States Lighthouse Board was formed in 1789, and reconstructed in 1852. In Sweden, Norway, Holland, Denmark, Russia, and Austria the lighthouse administration is under the Admiralty or minister of Marine. In Spain, the system of administration is similar to that of France. For American administration see the article LIGHTHOUSE BOARD OF THE UNITED STATES.

Progress in America.— From one of the poorest-lighted coasts, the American Atlantic seaboard has, within a quarter of a century, become one of the best in the world, and the new system of lighthouses and signal lights is far more comprehensive than anything heretofore attempted. The Cape Hatteras region, and the scarcely less important Cape Cod district, early received special attention. Both of these capes were in the direct route of commerce, and the storms and shoals that made them dangerous to navigators had to be offset by adequate lights which would warn mariners of their proximity. The first attempts at lighthouse construction were consequently made at a few such dangerous points along the coast, and from these in either direction new lights were gradually erected. They formed the beginning of the new system which seeks to make all of our coast so well protected that navigators need have little apprehension in approaching the land from any direction at any point. But the rapidly increasing commerce on both the Atlantic and Pacific seaboard has made in recent years a more comprehensive system of lighthouses imperative. Likewise the shipping interests of the Great Lakes, the Gulf of Mexico, and the great inland rivers, have multiplied in importance, and the need for better protection from dangers to navigation has been general. For a quarter of a century now the American lighthouse system has expanded and developed, until it has reached a point in its evolution where it is without question one of the best in the world.

The full extent of the lighthouse service can best be appreciated by simply stating that there are some 9,000 warning lights and signals stretched along the American coasts, forming a perfect link so that the navigator need never be beyond the sight of one of the beacons. Of this grand total — including lighthouses of different classes, buoys, beacons, and danger signals — over 3,000 are lighted, giving forth their signals at night time. One thousand of these lights are located on the Atlantic coast, 1,500 are scattered along the rivers and inland waterways, 500 on the Great Lakes, and 200 on the Pacific coast. The so-called lighted «aids» include a great variety of modern inventions, from the tall flashlight lighthouse, with its base of steel and stone, and costly lamp operated by electric power, to the modern gas and electric-lighted buoys, beacons and lightships. The advances made in lighthouse and buoy construction represent some of the marvels of modern engineering science.

In 1903, the most important light in the United States, the great tower at Barnegat, N. J., was completed with a light equipment equal to 30,000,000 candle-power. Steam and power are generated for local use, for the heart of the light is a 6,000 candle-power arc light. This is intensified by a great lens built up of rims of prismatic glass, with a bull's-eye in the centre 18 inches in diameter. This monster light can be seen at a distance of 100 miles; but, taking the curvature of the globe into consideration, sailors can make it out while still over 20 miles away. The Barnegat station is a most important one, being located on the most easterly point of the dangerous low-lying Jersey coast. See Plate.

In the matter of lightships the United States leads the world. More than 40 of these are stationed at points along our coast where beacons are necessary, but where the building of lighthouses is impracticable. The Diamond Shoal lightship warns the navigator of his approach to dreaded Cape Hatteras. For years the lighthouse board tried to build a lighthouse on Diamond shoal, but at last, after more than $250,000 had been spent and several lives lost, the attempt was given up.

The Fire Island lightship is one of the line of ocean lampposts which mark the entrance to New York harbor. It is equipped with a steam engine, electric lights, a steam whistle and many other improvements. The new South Shoal lightship, which is anchored 26 miles off Nantucket, is farther from shore than any other lightship in the world. It is the first American outpost and guards a shoal which in times past was a veritable graveyard for ships.

Steel Tubular Structures.— One of the most noted advances in modern times has been the abandonment of the old towers of stone or brick and the adoption of the steel tubular structures in their places. The latter are built more easily on a solid, rocky foundation than the old huge piles of masonry. The steel skeleton is bolted into the solid rock or anchored there by means of long spindle-like legs, which sink many feet down into the firm foundation. These huge cylindrical towers of steel withstand the pressure of wind far better than the stone and brick structures, and their strength is so great that there is practically no danger of their ever being seriously injured by the elements. Even where the lighthouses are built in the water to mark shoals or dangerous reefs, the steel tubular style of structure is adopted. The foundation work of the structure is built up above the water with stone or concrete, and to this the steel tower is bolted. The latter looks more like a giant smokestack than anything else, and its stands as a permanent beacon of the sea to warn mariners of their danger. Not only is additional strength and security obtained through the adoption of the steel tubular lighthouses, but the cost of construction is greatly reduced. Modern lighthouses cost far more than they did in former days, but that is due to the fact that they are built on a larger and more enduring scale, and the lights are of far greater power and intensity. A modern American lighthouse frequently costs $125,000, and often one third of this is spent in the electric light and apparatus alone. In the old system the lights represented a comparatively small proportion of the expense.

Bibliography.— Edwards, ‹Our Seamarks› (1886); Elliott, ‹European Lighthouse System› (1875); Heap, ‹Ancient and Modern Lighthouses› (1889); Stevenson, ‹Lighthouse Construction and Illumination› (1881); and United States Lighthouse Board's Annual Reports.

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Lighthouse Board of the United States, The, was organized in 1852 by Act of Congress, and has the management of all lighthouses, beacons, buoys, lights, etc. The board is composed of two naval officers, two engineers, and two civilians of scientific attainment. The Secretary of the Treasury is *ex-officio* president, while a chairman is annually elected from the Board. Standing committees are appointed on «experiments,» «lighting,» «engineering,» «finance,» and «floating aids to navigation.»

Light'ning and Lightning-rods. Franklin in 1751 proved that lightning is merely a vast electric spark; and until a generation ago, little was added to his exposition, to define the differentia of this special variety. The origin of atmospheric electricity is believed to be simple friction. Faraday showed that a powerful current could be excited by steam-driven spray against a water surface, and the friction of wind-driven mist on the earth's surface may produce a great difference of potential between the latter and the upper air, possibly though not probably assisted by the friction on dust particles in the air. In any event, rain conducts a portion of it to earth; so that a period of dry weather causes a great accumulation of electricity, the particles of air distributing their charges through each other. This would make the earth and sky, in Lodge's comparison, the two coatings of a Leyden jar, but ordinarily the distance is too great for a spark to pass. The effect of electrical discharges on vapor, however, is to condense it into larger globules; this causes it to sink toward the earth as cloud, and the enormous tension relieves itself by passing to the earth or objects upon it, preferably projections of some height. If conduction through the cloud were instantaneous, it would be drained of its charge in one immense flash; but it being a poor conductor, several flashes at different points are requisite.

The discharge is determined by the tension of the air, the maximum of which without rupture is ½ gramme per square centimetre. If the rupture is local, there is no flash, but only a brush; but it is often the case that when the weakest spot has given way, a general breach follows for a long distance, sometimes miles, creating the flashes which pass either from cloud to earth or from cloud to cloud; and as the discharge of this portion draws the remaining current toward it, a second flash or set of flashes is made probable. But this analysis shows what experiment proves, that this flash is not a single discharge, but the successive discharges of a countless number of vapor particles or raindrops toward the earth or other electrified particles in the air, with such rapidity of progress that they seem simultaneous; since it is most improbable that if vast numbers of points gave way at once, they should all give way in the same line. It has been further proved by Prof. Ogden N. Rood that even so, the flash is not a single sequence merely too swift for the eye to individualize; but although it lasts only a fraction of a second, it is itself composed of primary flashes in irregular sequence, each lasting but from a thousandth to a few thousandths of a second. This result was obtained by photography, which has invaluably supplemented laboratory experiment. By the latter, Prof. John Trowbridge has formed artificial flashes of lightning many feet long, made up of a combination of small discharges from a great number of petty cells. It had been long before proved by Joseph Henry that every electric discharge is an alternating or oscillating current, the periods of oscillation being only a few millionths of a second each and diminishing very rapidly in intensity; the entire duration depending on the magnitude and distance of the bodies. Hence it has been inferred that the small primary flashes are instances of these alternating discharges. Photography steadily tends to confirm these views.

Lightning according to its manifestations is divided into three classes. The «flash» or «stroke» lightning is the one had in mind when the name is used without qualification; it occurs either as a sharp zigzag line of extreme brilliancy, or the same forked, or in a wavy line oscillating with enormous rapidity, or in tree shapes with endless branches, or ribbon shape, or in a mass of strands of close but distinct parallel flashes like unraveled rope, or still other shapes. Dark flashes in photographs are only photo-chemical decompositions on the plate. The second sort is sheet lightning, a sudden glow of a golden or reddish tinge on the horizon, with no definite shape or bounds. It is not usually an actual discharge in that form, the very genesis of lightning making it rare; but is the reflection of lightning flashes out of sight beyond the horizon, cast on the clouds or atmospheric haze, and visible sometimes for many scores of miles beyond the place of the actual storm which causes the flashes. A third is ball lightning, which for a long time was not admitted as a genuine form of electric discharge, and is still a very difficult and in some points unexplainable phenomenon. It has not been photographed, though something like it has been produced on a small scale in the laboratory. It is described as a ball or globe of brilliant light moving slowly a short distance above the surface of the earth or even rolling upon it, and has been said on occasion to float through an open door or window into a house, as though drawn in by a draft of air; it usually explodes, but without doing much damage. Under the head of lightning is sometimes included Saint Elmo's fire or corposant,— jets and brushes of light seen not only at the tips of masts and yards of a ship in a thunderstorm, but on mountain tops, in hissing tongues of brilliant white and blue light several inches long.

The rope-strand lightning is not solidly accounted for; though there is general agreement that the first flash makes a rent or tube in the air, along which succeeding discharges rush back and forward. Of the multiple flash, the explanation most conformable to laboratory experiment — where a spark between electrodes has been made to assume a like shape by blowing across it — is that the tube does not close for a fraction of a second, and the wind always violently present in a thunderstorm moves the mass of air sidewise simultaneously enough to keep the tube intact for a moment. Another theory holds that the tube closes up too quickly for this, but is so large that the alternate flashes appear side by side.

The thunder and the large raindrops accompanying lightning are well understood. The heat produced by the electric discharge traversing the atmosphere causes a sudden expansion of the particles next it, with a sharp compression of those beyond, in a great wave; on its passage the particles contract as suddenly, and the waves roll violently back, producing the noise of thunder. From the relatively slow passage of sound in the air, and the increased and uneven refraction due to differences of temperature and wind movement, the thunder-waves very soon begin to rise and pass inaudibly overhead; so that it is rarely heard more than fifteen or twenty miles off. The consolidation of the vapor into drops has been exactly imitated in the laboratory by electrifying spray, which causes the mist particles at once to begin aggregating in large globules. It has been shown that the mutual repellence of particles ceases as soon as a difference of potential is established by electrification, which substitutes a sort of suction around centres of force.

Protection from Lightning.—The annual destruction of life and property by lightning is very considerable: the former cannot be prevented to any great extent — though common-sense as to exposure can be instilled,— the latter could in part. In the United States during 1900, 713 persons were killed; parts of the Rockies and the upper Missouri Valley were the most dangerous. This rate, about five per million, is larger than in other countries, from our great population of outdoor agricultural and ranching laborers. Fatalities are everywhere increased by the tendency to seek shelter from the rain when caught out in a storm; and these isolated shelters, as trees, barns, monument buildings in public parks, etc., are among the most liable to be struck. In the same year, 1,842 domestic animals were killed; barbed-wire fences are held blamable to a large extent, from the animals' habit of huddling in fence corners during a storm. Statistics of buildings struck are in some respect significant, in others not detailed enough for utility. Thus, in Schleswig-Holstein during 1874–83, the annual average of strokes for wooden and thatched roofs was nearly 2½ times greater than for slate or metal roofs, that for chimneys over 16 times as many even as the former, and that for windmills over one third larger still. On the other hand, we learn nothing from the fact that in the United States during 1900, out of 1,847 buildings struck, 40 had lightning-rods, 855 had not, and there is no report of 952, because not knowing what proportion of all buildings had them,— probably a very small one,— we have no percentages. On the other hand, it is notable that in nine years ending 1892, 2,335 barns, 104 churches, and 664 dwellings were struck, and the larger fire-insurance companies have generally ceased insuring farm buildings. Isolated buildings in general were in five times as great danger as those in city blocks, perhaps partly because protected by metal cornices, etc.

But is it worth while attempting to protect buildings in general from lightning? Aside from the fact that we are never sure a building struck may not involve a loss of life, the matter resolves itself into a question of cost, and it must be said plainly that it is not worth while. The problem is one for the insurance companies. In the eight years, 1885–92, in the United States, there were 3,516 fires from lightning, with a loss of $12,663,835, or a little over $1,500,000 a year. The insurable part of this was nearly all insured, and the practical question for property-holders is whether lightning-rods secure lower rates. Notoriously, they do not. The companies make not the least difference in rates for «protected» buildings, as to insurability or rates, and the officials rarely put them on their own dwellings; the lightning-rod business is virtually extinct in this country. The public would therefore gain nothing by the outlay; except that with uninsurable buildings, it would probably pay to enmesh them with metal points rather than undergo the risk. Of course also there are many cases where even a heavy expense ought to be incurred, as with buildings or their contents not replaceable with money,— historic or noted architectural structures, museums, etc. But the fact remains that to reduce this $1,500,000 to one third that amount would cost fifty times the saving in gross and several times the amount in yearly interest.

If protection is desired, however, it is fully proved that a great quantity of scattered metal points — whether iron or copper is immaterial, and iron is cheaper — is the most effective; a mesh of barbed-wire fence over the roof and chimneys would be not only the cheapest, but one of the most effective protections. Perfect safety would be obtained by enclosing the building in a metal sheath, as no electric discharge can penetrate into an enclosed metal safe; next to this, a closely meshed wire cage; next a number of metal rods or wires all around. One rod is of little moment. Bulk of rod is of no avail, because the flash is so sudden that the interior or core of the rod has no chance to operate, all the discharge passing back and forth along the «skin»; but as the latter is liable to corrosion, the wire should not be too thin. The heavy copper rods of old time, however, are not regarded as needful. Nor can any rods or wires ensure absolute protection. The old «conduit» theory of draining off the lightning, and having a good conductor to prevent resistance and insulators to prevent jumping, is now discarded: it is recognized that there is an enormous amount of electric energy to be discharged almost instantly, it is almost certain to distribute itself around a considerable area, and all that the points can do is to insure and regulate that distribution. There should always be a good «ground» or «earth» at the bottom, as a ton of coke or a water ditch. Consult Lodge's ‹Lightning Conductors and Lightning Guards,› 1892.

Lightning Arrester, in telegraphy, a contrivance for guarding against passage of atmospheric electricity through the instruments. The line wires are attached to a plate of brass, usually serrated on the under side. This plate rests on another plate connected with the ground, the two being separated by a thin layer of insulating material.

Lightning-stroke. The effects of lightning-stroke on the body resemble those produced by large amounts of electricity at high voltage. Persons subjected to the influence of lightning-stroke may suffer very slightly or may be killed, and between these extremes a vast variety of minor or major injuries may result. The most characteristic form of injury is some sort of burn. This occasionally shows on the skin as an arborescence, which was formerly thought to resemble the tree under which a patient had sought shelter during a storm, but is, of course, solely an effect of the zig-zagging of the electrical discharge. In many persons mental shock and prolonged nervousness are frequent symptoms. Mild stunning, with a sense of suffocation, may be experienced when an electrical bolt strikes near a person, and occasionally nervous and hysterical attacks are induced. Suppression of menstruation and abortion have been reported. Numbness and prickling of various areas of the body; paralysis of the muscles; deafness; loss of smell and taste; and paralysis of the bladder and rectum have all been described. Occasionally insanities follow lightning-stroke. The experiences of persons who have been exposed vary greatly; but flashing in the eyes, buzzing in the ears, general tremor, which may go on to convulsions, with or without loss of consciousness, are not uncommon, and people who have been seen in this stage have been described as being blue, with muscles tightly contracted, the pupils dilated, the breath deep and snoring, and pulse feeble.

In death by lightning, changes in the nervous system have been found, and it is probable that the cause of death may be either the result of minute hemorrhages, which take place in the important centres of breathing and of the heart-action and in the medulla; or death may be the physiological effect of the electricity on the heart, causing a form of heart-tetanus, with rapid cessation of the movement of this organ.

The treatment of lightning-stroke, as well as of other forms of electrical injuries, should be promptly instituted. If commercial currents are used they should be removed at once, care being taken to use insulating materials to remove live wires. External heat to the body with hot-water bottle, cardiac stimulation with whiskey, ammonia, etc., with artificial respiration, should be simultaneously used.

No method of artificial respiration or other attempt to produce consciousness should be abandoned under three to six hours, as often no signs of life may be brought out in less than two to three hours. It is seriously advised by some observers that, before giving up all hope, an injection of an alkaline solution into the blood should be used. Hot saline solution may be thrown into the rectum, and the treatment should be continued until all possible methods of resuscitation have been employed. Consult Jelliffe, 'Death by Lightning and Electricity' (in 'Text-book of Legal Medicine and Toxicology,' 1903).

Lighton, William Rheem, American prose writer: b. Lycoming County, Pa., 13 July 1866. He was admitted to the Kansas and Nebraska bar in 1891 and has published 'Sons of Strength: a Romance of the Kansas Border Wars' (1899); 'Lewis and Clark,' in 'Riverside Biography' Series.

Lig'nin, the substance of wood-fibre, formed in part at least by conversion from cellulose (q.v.), and contained within the cellular tissue, giving hardness and weight to the woody parts of plants. Its chemical composition is not determined, but it is characterized by being soluble in weak alkalies and insoluble in water.

Lig'nite, a partially carbonized fossil wood, retaining its woody fibre, and intermediate in its qualities between peat and coal. It is found in the secondary and tertiary strata, but chiefly in the latter. For description of lignite, and especially for composition of American lignites, see Coal.

Lig'num Vitæ, vī'tē. See Guaiacum.

Ligny, lēn'yē, Belgium, village, 14 miles northwest of Namur, celebrated by the defeat of the Prussians under Blücher by the French under Napoleon, 16 June 1815, the same day on which Ney's command was engaged with the British under Wellington at Quatre-Bras. The Prussians lost 12,000 men and 21 cannon; the French, 7,000 men.

Liguori, lē-gwō'rē, **Saint Alfonso Maria de,** Catholic prelate, founder of the religious order called Redemptorists: b. Naples 26 Sept. 1696; d. Nocera, Italy, 1 Aug. 1787. He was originally a lawyer, but became a priest in 1722, joined the Congregation for the Propagation of the Faith, instituted in Naples, and occupied himself as a missionary in the instruction of the ignorant peasantry. In 1732 he founded a monastery at Villa Scala, the members of which were called the Order of the Most Holy Redeemer and were to be employed in the instruction of the people. This order, approved of by Pope Benedict XIV. in 1749, rapidly extended in Italy, Germany, Spain, and France. Liguori was in 1762 appointed bishop of Santa Agata de' Gotici by Clement XIII., from which office he resigned in 1775. He was canonized in 1839, and in 1871 was declared a doctor of the Church. His 'Theologia Moralis' has appeared in several recent editions (Ratisbon, 1881; Turin, 1892; Genoa, 1898), and there is a German edition of his letters (Ratisbon, 1893, et seq.).

Liguria, lĭ-gū'rĭ-ạ, in ancient Greek and Roman geography that portion of northern Italy extending along the Mediterranean from the frontiers of Gallia Cisalpina to those of Etruria, bounded on the north by the Po, east by the Macra, and west by the Varus. These were its limits at the time of Augustus, but at an earlier period it extended to the borders of Gaul, or even to the mouths of the Rhone. In 1797 Genoa received from Napoleon I. a democratic constitution, under the appellation of the Ligurian Republic. This republic ceased to exist in 1805, when the emperor incorporated it with France. After 1814 it formed part of the kingdom of Sardinia, and now of that of Italy, in which it comprises the provinces of Genoa and Porto Maurizio.

Ligu'rian Republic. See Liguria.

Lija, a fish. See File-fishes.

Lilac, a genus of ornamental deciduous shrubs and trees (*Syringa*) of the order *Oleaceæ*. The species are characterized by opposite slender-stalked leaves, and purplish or white usually fragrant flowers in erect panicles. Nearly all the species, which have developed many horticultural varieties, are valued for park and garden planting, on account of their hardiness and free-blooming qualities. The common lilac (*S. vulgaris*) is a native of southwestern Asia, whence it was taken to Vienna during the closing years of the 16th century. It is probably the most widely planted of all the species. The wood of its larger specimens, which sometimes attain heights of more than 20 feet, is valued by cabinet makers, for turning and inlaying. About a dozen species are cultivated in America. They do best in deep, rich soil, but will succeed almost anywhere; indeed, they are likely to become a nuisance from their habit of suckering, a habit taken advantage of for propagating purposes. Cuttings are also used, and some of the newer and choicer varieties are grafted upon ordinary lilac or upon privet stocks. During the closing years of the last century the plant came into vogue as a florists' flower, large quantities being forced for the winter and early spring markets.

Lilburne, lĭl'bėrn, **John,** English sectary and political agitator: b. Thickney Puncharden, County Durham, about 1614; d. Eltham, Kent, 29 Aug. 1657. For putting forth tracts hostile to the Anglican Church he was whipped and imprisoned in 1637, but was released by the Long Parliament in 1640, and the conviction having been declared illegal and tyrannic, he received $15,000 indemnity. He then joined the army, and rose to the rank of lieutenant-colonel. He was one of the party known as the "Levellers" (q.v.), and for his attacks on Cromwell and others was several times committed to the Tower. Having been exiled and having returned without leave, he was put in prison and tried for his life, when he was acquitted but not liberated for some time. Subsequently he became a member of the Society of Friends. Hume describes him as "the most turbulent, but also the most upright and courageous of men."

Liliaceæ, lĭl-ĭ-ā'sē-ē, or **Lily Family,** one of the most important orders of plants because of the uses made by man of many of its species, about 2,500 of which are comprised in nearly 200 genera. The characteristics of the group are monocotyledonous seeds; usually herbaceous stems which arise from bulbous, tuberous or rarely fibrous roots; generally narrow, simple leaves; and six-parted or toothed flowers solitary or arranged in various ways, such as panicles, racemes, etc. In habit, many are adapted to deserts. some to ponds and streams, others are climbers, etc. Among those useful for food may be mentioned asparagus, onion, garlic, leek, chive, rocambole, shallot, camass and various species of lilies. A very large number of species are used for ornament; for example, lily, hyacinth, tulip, fritillary, lily-of-the-valley, tuberose, Allium, and Yucca. Several species of Xanthorea and Dracæna yield useful resins; some of the genus Chloragalum furnish a substitute for soap; and certain species of Yucca, Sanseveria, and of other genera, yield valuable fibres. Isolated species of various genera have been used in medicine.

Lil'ienthal, Max, American rabbi: b. Munich, Bavaria, 15 Nov. 1815; d. Cincinnati, Ohio, 5 April 1882. Graduating from the university of his birthplace, he was called to the directorship of a Hebrew school in Riga, Russia, and at government expense traveled through the 17 western provinces of Russia to encourage the Jews to make educational reforms. In 1842 this mission was ended, and until 1845 he remained in St. Petersburg, perfecting his educational system, when the Czar Nicholas issuing orders which aimed at the conversion of the Jews to the Greek Church, he emigrated to America. On his arrival in 1844 he was made rabbi of three synagogues, but in 1850 resigned to establish a school. In 1855 he accepted a call as rabbi of the B'nai Israel Congregation of Cincinnati, a position he held until his death. He was foremost in civil and educational reform, an active member of the board of education, and a director of the Cincinnati University. He was prominent in the councils of the Free Religion Associations, and always championed the cause of progressive Indians with his voice and pen. He aided largely in the establishing of the Hebrew Union College, and as an orator did much in his addresses in churches and on the public platform to promote social and religious reform.

Lil'is, or **Lilith,** a character in Jewish mythology. The Talmudists say that Adam had a wife before Eve, whose name was Lilis. Refusing to submit to Adam, she left Paradise for a region of the air. She still haunts the night as a spectre, and is especially hostile to newborn infants. Some superstitious Jews still put in the chamber occupied by their wives four coins, with labels on which the names of Adam and Eve are inscribed, with the words «Avaunt thee, Lilith!» Our word «lullaby» is said to be a corruption of «Lilla, abi» (Lilith, avaunt).

Liliuokalani, lē-lē-wō-kä-lä'nē, **Lydia Kamekeha,** kä-mā-kä'hä, ex-queen of Hawaii: b. Honolulu 2 Sept. 1838. She was a sister of King Kalakaua, and succeeded him in 1891. She was married to John O. Dominis, an American (d. 1891), who became governor of Oahu. She attempted to substitute a less liberal constitution for that of 1887, and this course resulted in her being deposed 30 Jan. 1893. The islanders then adopted a provisional government, which soon became a republic. She endeavored to secure assistance from the United States, visiting Washington in 1896 for that purpose, but on the annexation of Hawaii to the United States, in 1898, returned to the island. She revisited the United States in the winter of 1901–2 to press her claims for idemnity on the crown lands. See HAWAII.

Lille, lēl, France, an important town, capital of the department of the Nord and chief fortress of the north, 127 miles north of Paris, and 7 miles from the frontier of Belgium. The former capital of French Flanders it was fortified as early as 1007. It is well built, and has spacious, regular streets, lined with large, massive houses. In the northwest of the town stands the citadel, a masterpiece of Vauban. New fortifications include a circle of detached forts. Among the churches are: St. Maurice, in the flamboyant style, recently restored; Notre Dame de la Treille, in 13th century Gothic; St. Catherine; the Madelaine; and the Protestant Church. Among secular buildings are the Hôtel de Ville, with rich collections of pictures, drawings, etc.; the exchange (1652); the prefecture; the palace of justice; the arsenal; the Paris Gate, a triumphal arch in honor of Louis XIV.; the general hospital; the theatre; and the concert-hall. Lille possesses a state university with four «faculties,» a Roman Catholic university, lyceum, communal college, school of art, conservatory of music, public library of 100,000 volumes, botanic garden, zoological garden, etc. The industries include cotton spinning and weaving, fine linen thread, linen and cotton twist, broadcloth, beet-sugar (raw and refined), soap, oil, ribbons, tulles, tobacco-factories, engine-works, foundries, dye-works, bleach-fields, breweries and distilleries. Its situation on the frontier and extensive railway and water communication, make Lille a great entrepôt of trade. Pop. (1901) 215,431.

Lillibullero, lil''ĭ-bŭ-lē'rō, a political ballad that «sung James II. out of three kingdoms.» A scurrilous attack on the Irish recruits, it is said to have been written by Lord Wharton in 1686, and the setting is ascribed to Henry Purcell.

Lillie, lĭl'ĭ, **Arthur,** English author. He went to India and served in the Bengal infantry 1847–63. He has published: ‹Out of the Meshes,› a novel (1869); ‹Buddha and Early Buddhism› (1881); ‹Buddhism in Christendom› (1887); ‹The Influence of Buddhism on Primitive Christianity› (1893); ‹Madam Blavatsky and her Theosophy› (1895); ‹Buddha and Buddhism› (1900); etc.

Lillie, Lucy Cecil White, American writer of juvenile and other books: b. New York 1855. Among her many works are: ‹Prudence,› a novel (1882); ‹Rolf House› (1886); ‹The Colonel's Money› (1888); ‹The Squire's Daughter› (1891); ‹Alison's Adventures› (1895); ‹Honest Endeavor›; ‹Kenyon's Wife.›

Lilliput, lĭl'ĭ-pŭt, the name of a fabulous kingdom described by Jonathan Swift (q.v.) in ‹Gulliver's Travels,› of which the inhabitants are not greater in size than a man's finger.

Lillo, lĭl'ō, **George,** English dramatist: b. London 4 Feb. 1693; d. there 3 Sept. 1739. The son of a Dutch jeweler, he was brought up to his father's trade, and was for several years in partnership with him. ‹Silvia, or the Country Burial’ (1730), a ballad opera, was his first piece; and was followed (1731) by the famous ‘London Merchant, or the History of George Barnwell,’ nowadays better known by its subtitle, which made its author famous, and held the stage for nearly a century. It had a marked influence in its day, and may be regarded as a precursor of the “domestic drama.” His other dramatic productions include: ‘Britannia, or the Royal Lovers’ (1734); ‘Fatal Curiosity’ (1736); ‘Arden of Feversham,’ an adaptation of an Elizabethan play, revised or completed by John Hoadly after Lillo’s death.

Lilly, lĭl'ĭ, **William,** English astrologer: b. Diseworth, Leicestershire, 1 May 1602; d. Horsham, Surrey, 9 June, 1681. In 1632 he became interested in astrology, and two years later was associated with others in an unsuccessful search for treasure in the cloisters of Westminster Abbey. In 1644 he published the first volume of his almanac, ‘Merlinus Anglicus Junior, the English Merlin Revived, or a Mathematical Prediction upon the Affairs of the English Commonwealth,’ which appeared annually till his death. The king of Sweden sent him a gold chain and medal in 1659 in recognition of a favorable horoscope cast for him a short time before. He published many works, and was frequently engaged in controversy. His chief writings are: ‘Christian Astrology, modestly treated in Three Books’ (1647), reprinted in 1852 by Zadkiel as ‘An Introduction to Astrology’; ‘An Astrological Prediction of the Occurrences in England for the Years 1648, 1649, 1650’ (1648); ‘Monarchy and No Monarchy’ (1651); ‘True History of King James I. and King Charles I.’ (1651); ‘Annus Tenebrosus’ (1652); ‘Anima Astrologiæ’ (1676); and ‘Catastrophe Mundi’ (1683). Butler satirizes Lilly in Hudibras under the name of Sidrophel. His autobiography was published in 1715.

Lilly, William Samuel, English controversial writer: b. Fifehead, Dorsetshire, 10 July 1840. He was educated at Cambridge and has been secretary to the Catholic Union of Great Britain from 1874. He is a champion of the Roman Catholic point of view in such works as ‘Ancient Religion and Modern Thought’ (1884); and ‘The Claims of Christianity’ (1894). Other works of his are: ‘A Century of Revolution’ (1899); ‘First Principles in Politics’ (1899); ‘Essays and Speeches’ (1897); ‘A Year of Life’ (1900); ‘Renaissance Types’ (1901); ‘India and Its Problems’ (1902).

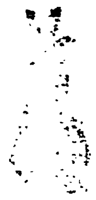
Lily. The type genus (*Lilium*) of the order *Liliaceæ* (q.v.). The several hundred well marked species which have been described are succulent herbs with scaly bulbs and usually leafy upright stems terminated by solitary or variously grouped six-segmented flowers of very diverse colors and markings. In general, lilies are among the most popular of garden flowers, having held this position for centuries. But in the United States they have not taken the high rank that they hold in Europe, especially in Great Britain. This is probably due largely to the dryer, hotter climate, and the injudicious planting of the bulbs where they cannot long survive.

The various species and their varieties are adapted to a wide range of soils, a few, such as *L. tigrinum, L. canadense,* and *L. superbum,* often succeeding in heavy land if well drained, and some, such as *L. washingtonianum, L. philadelphicum* and *L. concolor* withstanding the peculiar conditions of slaty ridges if deeply planted and well mulched during the growing season. But the greater number thrive best upon fairly rich, well drained, deep sandy loam, especially if sheltered from prevailing winds and the hot sun of midsummer. Not that the stems cannot stand sunlight; but the bulbs and roots should be cool and well but not excessively supplied with moisture and food. The bulbs should always be planted deeply, six inches or more, and the soil stirred to double the depth of planting. This not only assists in keeping the roots cool but protects the bulbs from excessive freezing, which seems to have some effect upon the vitality of shallow planted specimens of even the hardiest species. Since vitality is also impaired by the exposure of the bulbs to the air, great care should be taken in transplanting to place the bulbs back in the soil as soon as possible after their removal. Transplanting is best done in early spring, the clumps being dug up, divided, the large bulbs planted in new, permanent quarters and the small ones and the bulb scales in nursery beds, where they should remain from one to three years, according to size when planted and to the species. One reason why bulbs obtained from seedsmen fail is because of undue drying. Orders for lilies should be given before the seedsman can obtain the bulbs, and they should be filled by him without delay after the bulbs arrive. Often bulbs become so flabby from loss of moisture that they may fail to grow until the second year. Hence it is advisable to plant all but plump and turgid bulbs in a nursery bed, or where they may remain undisturbed for a year or two before being placed in permanent quarters. Propagation by means of seeds is slow in most cases; and many species rarely produce seeds in the United States.

The Bermuda Easter lily (*L. longiflorum,* var. *eximium*) is the only kind that is forced upon a commercial scale in the United States, though several other kinds are to be found in the principal florists’ stores and in private conservatories. For forcing, the bulbs of this variety are planted as soon after their arrival from Bermuda as possible, generally before the end of September, and are kept in a cool dark place until roots are well developed and the tops commence to form, when they are brought into the light, and by judicious management of heat, are hastened or retarded to ensure their blossoming at desired seasons, especially Easter Sunday. The management of other varieties used in greenhouses is more or less closely similar.

In general, lilies are most effective when mixed in small masses among shrubbery and hardy flower borders, the various kinds being sufficiently separated either in distance between the groups, or in season of blossoming, to avoid the clashing of inharmonious colors. Many of them have been used thus for ornamental planting, but though the great majority are well worth growing, scarcely a dozen have become widely popular in the United States, and of these not one is a native American species.

The following are probably the best known species: Tiger lily (*L. tigrinum*), a Japanese species, often exceeds three feet in height and bears a loose raceme of sometimes a dozen nod-



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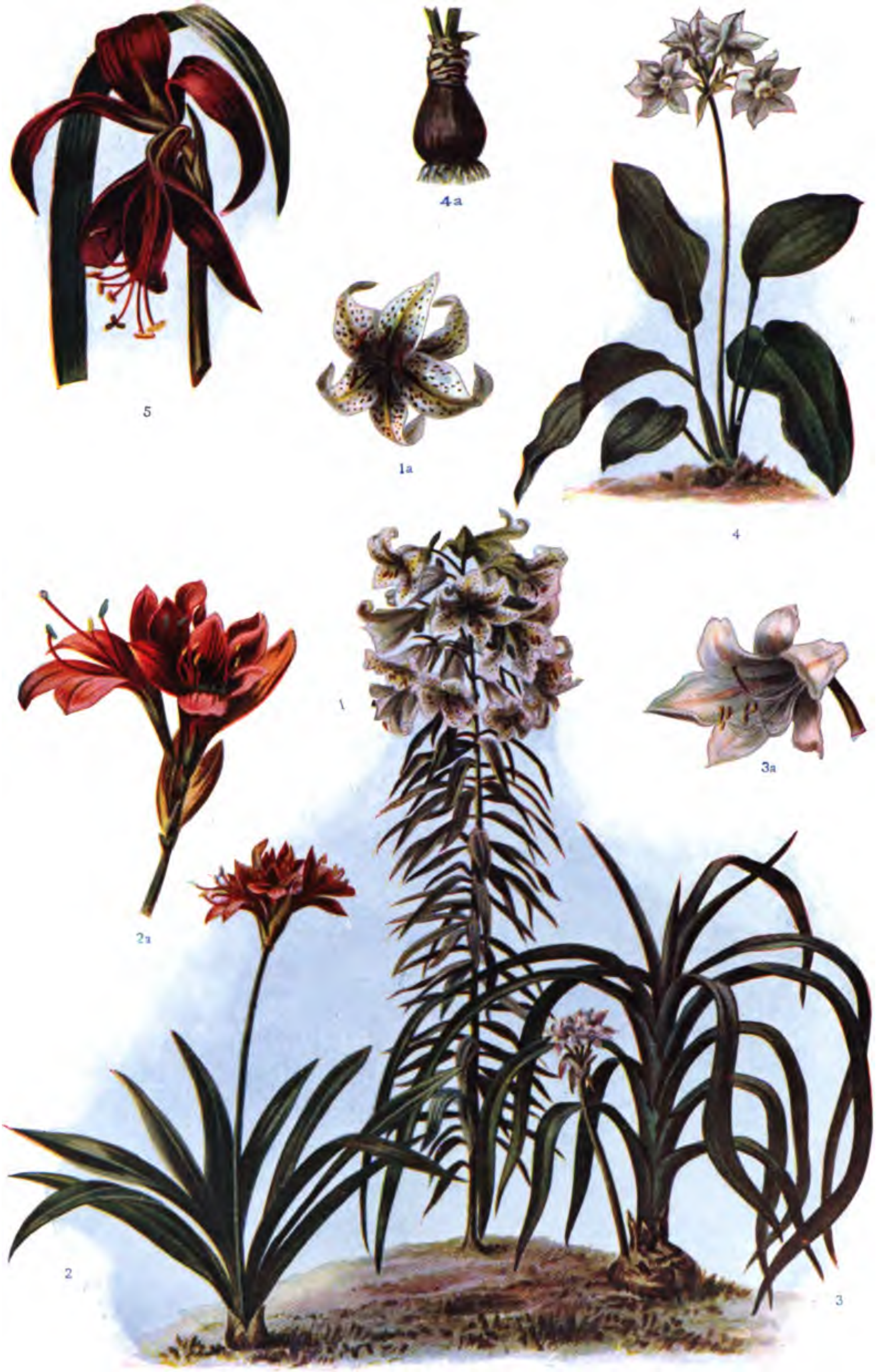
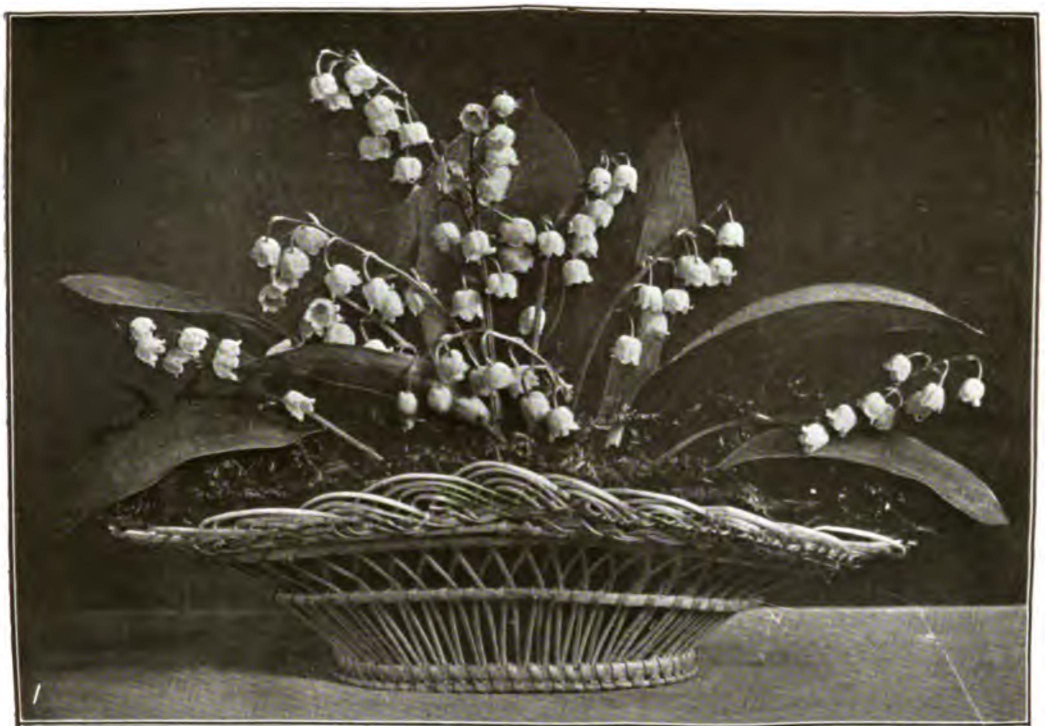
LILIES AND AMARYLLIS



1. Golden Lily (Lilium auratum). 1a. Blossom, enlarged. 2. Garden Amaryllis. 2a. Blossom, enlarged. 3. Crinum scabrum. 4. Eucharis amazonica. 4a. Root-stock. 5. Jacob's Lily (Amaryllis formossima).



1. Lilies of the Valley.
2. Golden-Banded Lily of Japan.

ding dark-red, purplish-spotted flowers. It is a very hardy, useful species for the border, where it does best in masses. Madonna lily (*L. candidum*), a native of southern Europe, often attains three feet, bears from half a dozen to two dozen large pure white fragrant flowers in a raceme. It is a highly ornamental species, will do well upon sandy soils and in full sunlight. The Siberian coral lily (*L. tenuifolium*), which seldom exceeds two feet in height, bears from one to a score of scarlet, nodding flowers. Being very easy to propagate from seeds and bulb scales and of simplest culture, it is especially popular with beginners. Gold banded or Japan lily (*L. auratum*), which sometimes attains four feet, bears a few yellow-banded, purple-spotted, white flowers in a short raceme. It is less persistent than the tiger, and the showy lily, and somewhat less easy to cultivate, but is particularly useful for planting among groups of dark colored shrubbery. Showy lily (*L. speciosum*), a Japanese species, often exceeds three feet, bears six or more white or pinkish, red-dotted flowers in a raceme. It is a specially hardy, thrifty and satisfactory species both for out-of-door planting and for greenhouse use. Next to the Bermuda Easter lily and *L. longiflorum* it is probably more widely grown by florists for cutting than any other kind. It has both white and red varieties. *L. longiflorum*, the original species of the Bermuda Easter lily, is forced in the same way as its variety. It is a native of Japan, from which country most of the bulbs are imported.

Besides the species mentioned the following are considered worthy of wide popularity: *L. chalcedonicum*, *elegans*, *testaceum*, *maximowiczii*, *martagon*, *maculatum*, *henryi*, *monodelphum* and *superbum*. These do well with little care upon ordinary light loamy soils. *L. canadense* and *superbum* succeed upon the same soils but require rather shady places. For cold climates even as far north as Ottawa, Canada, the following have proved successful: *L. brownii*, *wallacei*, *citrinum*, *croceum*, *melpomene*, *pardalinum*, *pomponium*, *dahuricum* and *batmanniæ*. The odors of *L. croceum* and *pomponium* are very offensive even in the garden, and when they are planted they should be at some distance from the house. Among the most fragrant are *L. longiflorum*, *auratum*, *candidum* and varieties.

Consult: Bailey, ‘Cyclopedia of American Horticulture,’ 1900–2; Elwes, ‘A Monograph of the Genus Lilium,’ 1880; ‘Botanical Gazette,’ Vol. XXVII., p. 235 (1899).

Lily-of-the-Valley, a low-growing perennial herb (*Convallaria majalis*) of the lily family, with creeping rootstocks from which ascend radical leaves and little white or pink fragrant flowers arranged in racemes upon scapes. The plant being a native of western Asia is one of those popularly supposed to be referred to in the Sermon of the Mount, the tulip being another. The plants are perfectly hardy. They thrive in partially shaded fairly rich loam, and may be readily propagated by means of the underground parts. Since beds are apt to run out they should be renewed every few years. The strong terminal buds known as pips are extensively used by florists for forcing the flowers throughout the year. Several horticultural varieties have been produced, some with variegated or striped foliage, others with pink, variegated or double flowers. A highly esteemed perfume, *eau d'or*, is made in France from the flowers; and the rootstocks have been used by druggists, but are less popular than formerly.

Lilybæum, lĭl-ĭ-bē'ŭm, the ancient name of Cape Boeo (q.v.).

Lima, lī'mạ, Ohio, city, county-seat of Allen County; on the Ottawa River, and on the Erie, the Pennsylvania, the Cincinnati, H. & D., the Detroit Southern and the Lake Erie & W. R.R.'s; about 70 miles north of Dayton and the same distance south of Toledo. It is situated in an agricultural region and in the natural gas and petroleum belt of the State. The oil fields extend into six counties in the northwestern part of the State. The chief industrial establishments are locomotive and car works, machine-shops, petroleum refineries, and railroad shops. The shipping trade is chiefly in petroleum, farm and dairy products, and railroad car equipments. The city is the seat of Lima College, opened in 1893 under the auspices of the Lutherans. The city owns and operates the waterworks. Pop. (1890) 15,981; (1900) 21,723.

Lima lē'mä, Peru, South America, a department in the western part, on the Pacific Ocean; area, 13,310 square miles. It is mountainous in the east, but along the coast the land is low, and in the river valleys productive. A number of villages and towns are in the valleys. One of the principal agricultural productions is sugar. There are rich mineral deposits, but as yet the mines are undeveloped. Pop. about 300,000.

Lima, Peru, South America, city, capital of the department of Lima; on the Rimac River, seven miles from the Pacific. Callao, on the Pacific, at the mouth of the Rimac, is the port of Lima; it is connected with Lima by two railroads, one on each side of the Rimac. Another railroad extends from Lima to Concepcion, a town on the eastern slope of the Andes. This railroad is in one place 15,000 feet above the sea. The city was founded by Francisco Pizarro 1535 and named Ciudad de los Reyes, «City of the Kings,» because the site was chosen on 6 January, the feast of the «Wise Men,» or the «Three Kings.» Lima has considerable manufacturing industries and is developing rapidly. The adobe walls which surrounded the city were destroyed in 1870, and boulevards made in their place. The city has long been famed for its educational institutions; the national university, chartered in 1551, is the oldest university in America. It has courses in theology, law, medicine, applied science, political science, art, and music. The national library, founded in 1822, with some books from older libraries, was destroyed in 1880 by the Chileans. It contained then 60,000 volumes. It now contains about 50,000 volumes. There are several other libraries in the city. There are several technical schools, professional classical, naval, and military, and about 100 elementary schools, besides a number of small private schools. Several scientific and literary societies provide public lecture courses. The city is noted for being the home of the first American canonized by the Roman Catholic Church, Saint Rose of Lima (1586). It has frequently suffered from earthquakes; the most destructive of which any record exists occurred in October 1746. At the time of the war between Peru and

Chile, the city capitulated without any resistance, and the Chileans kept possession for two years. Pop. about 116,000. Consult: Mortimer, ‹Peru›; Middendorf, ‹Peru.›

Lima e Silva, Luiz Alves de, loo'ēs ăl'vēs, dā lē'mă ē sēl'vă, duke of Caxias, Brazilian soldier and politician: b. Rio de Janeiro 25 Aug. 1803; d. Santa Monica, province of Rio de Janeiro, 7 May 1880. He rose to the rank of brigadier in the Brazilian army, was successively president of Maranhão, vice-president and military commandant of São Paulo, and president of Rio Grande do Sul; and in 1851–2 was commander of the Brazilian army, which, with Urquiza, defeated the dictator Rosas at Monte Caseros and drove him from Buenos Ayres. In 1855 he became minister of war; and from 3 Sept. 1856 to 3 May 1857 and again from 3 March 1861 to 4 May 1862 was prime-minister. He commanded the army of Brazil against Paraguay in 1866–9, and from 25 June 1875 to 5 Jan. 1878 was a third time premier.

Limburg, lĭm'boorg, or **Limbourg,** lăṅboor, (1) a province in the northeast of Belgium, separated from the Netherlands province of Limburg by the Maas or Meuse; area, 931 square miles; pop. (1900) 240,796. It is flat throughout, and a considerable part of it, particularly toward the north, belongs to the Campine (see Belgium), and is desolate in the extreme. Hasselt is the capital, (2) a province in the Netherlands, partly bounded by Rhenish Prussia and Belgium; area 850 square miles; pop. (1901) 292,072. It is partly flat, partly undulating, rich and fertile along the Maas, but in the north and west cold and sterile, large portions being covered with heath and marsh. Besides Maastricht, its chief towns are Roermond, Venlo, and Weert. There was formerly a county and duchy of Limburg. See Belgium; Netherlands.

Lim'bus, a name given in Roman Catholic theology to the place where the patriarchs remained until the advent of Christ, who, before his resurrection, appeared to them, and opened the doors of heaven for them.

Lime, also known as caustic lime, quicklime or calcium oxide (CaO) is snow white in color and strongly alkaline, being one of the strongest bases. In contact with water for which it has great affinity it increases in bulk, evolves much heat and changes to the hydrate (CaH_2O_2). Unless kept in a dry place it will absorb moisture and carbonic acid gas from the air and change to the carbonate ($CaCO_3$) (see Calcium). Lime except for certain impurities is entirely soluble in water, the principal insoluble impurities being silica, alumina and iron oxide. It is never found native. For ordinary commercial uses lime is obtained by heating limestone, shells or other material composed of calcium carbonate to a temperature high enough to drive off the carbonic acid gas. As the materials used vary in purity, so is there a corresponding difference in the purity of the lime produced. Owing to its property of hardening, by change to calcium carbonate, and its comparative cheapness, lime is the most important of building materials. For commercial purposes the many varieties of lime are grouped into, (1) common or fat limes containing less than 10 per cent of impurities, (2) poor or meagre limes containing 10 to 25 per cent of impurities, (3) hydraulic limes containing 15 to 40 per cent of impurities and (4) hydraulic cements which may contain as high as 70 per cent of impurities.

Common or fat limes in slaking evolve much heat and increase in bulk from two and a half to three times; except for some impurities they are entirely soluble in water. In hardening they shrink, and hence in making mortar require the addition of a large amount of sand. As fat limes are cheap and abundant and can take a large proportion of sand in making mortar, they are generally used for masonry. The poor or meagre limes are seldom used in this country. The hydraulic limes, so called from their property of hardening under water, though valuable for certain purposes, are also seldom used in the United States for masonry. They slake more sowly than ordinary limes with little rise of temperature and little increase in volume. Hydraulic cements (see Cement) do not slake and do not require the addition of sand to form mortar. They also set or harden much more quickly than ordinary limes, as the formation of calcium carbonate is a slow process that may under certain conditions take years, while in some quick-setting cements the formation of the calcium silicates and aluminates to which setting is due may take place in a few hours.

Limestone, marble and shells are burnt to lime by exposure to a temperature of 850 to 900° C. in a current of air. The harder the limestone the longer the time required for burning, but the better the product. Impurities in the limestone may or may not be injurious, depending on the quality of lime desired. Moisture in the limestone, or added to the charge, as by a steam jet, helps carry off the carbonic acid and hastens burning. Lime burning may be done in heaps or kilns. Heap burning in which pieces of limestone are piled on a grate of wood, then covered with fines or clay and fired, is now little used. Of kilns there are various types, intermittent and continuous firing. Of intermittent kilns the old «dug out» kilns built of ordinary brick on masonry into the side of a hill require about 72 hours for each firing. Heat is supplied by a coal or wood fire at the bottom. For continuous firing vertical kilns 20 to 25 feet high with draw openings, preferably below the fire line, are used, the lime being drawn every six hours. To supply moisture, water is kept in an iron pan in the ash-pit. In the kilns most commonly used there is no grate, but the fuel, preferably charcoal or anthracite, is charged with the limestone. The lime is not as pure as from furnaces with a bottom grate, but the consumption of fuel per pound of lime made is less. In such kilns burning is started by partly filling the kiln with limestone, putting in a thick layer of kindling wood and coal, starting the fire, and then adding alternate layers of coal and limestone. The type of continuous kiln in most favor is vertical, about 25 feet high, bottle-shaped and made of boiler iron lined with fire brick. Such a kiln may use petroleum for fuel, the oil being injected through openings in the wall just above the widest part of the furnace. Vertical kilns fired with gas have not proved successful. The type of kiln that requires the least fuel for amount of lime produced is the horizontal circular Hofman kiln, also used for making brick, drain tile, etc. The fuel is fine coal or even coal dust, and is put in through openings in the top. The lime produced is lighter than that from vertical kilns, slakes more easily and hence cannot be stored as well.

Most of the lime made is used for building purposes, but lime is also used for making glass and artificial stone, as an agent in many chemical processes, as whitewash, and was until recently largely used in sugar-making to separate sugar from molasses. No statistics of the amount of lime annually made in the United States have been compiled, but the value of the 1901 output was over $8,400,000. See LIMESTONE.

S. SANFORD,
Assoc. Editor 'Eng. and Min. Journal.'

Lime, a shrub or small tree (*Citrus medica*, var. *acida*), a variety of the citron (q.v.) resembling the lemon in habit but rather more prickly and spreading; its fruits, also, are more nearly spherical, more acid and rather bitterer than commercial varieties of lemon. It is a native of southeastern Asia, whence it has spread to other warm countries where its juice is highly valued for making cooling drinks. In Florida and the West Indies, which supply the American market, large thickets of wild limes are to be found and these add to the crops from the cultivated groves. In California the lime is little cultivated because the cheapness of Mexican fruit prevents the realization of a profit from orchards. The lime is one of the most important sources of citric acid (q.v.). The trees are propagated, cultivated and trained much like lemon trees, but are planted closer together. They will stand poorer, stonier soil and nearer proximity to the ocean than other citrous fruits. The name is given in the Orient to various sour-fruited trees related to the true lime; in Europe and occasionally in the United States to the lindens (q.v.); and locally in the Southern States to the sour tupelo (q.v.), whose tart fruit is eaten.

Lime Light. See CALCIUM LIGHT.

Limerick, lĭm'ē-rĭk, Ireland, a city and civic county, capital of Limerick county, at the interior extremity of the estuary of the Shannon, 106 miles by rail southwest of Dublin. It consists of three portions connected by five bridges, English Town on King's Island, and Irish Town and Newtown Pery on either side of the river. Limerick is of very ancient foundation, being mentioned by Ptolemy as Regia. The principal buildings are the Episcopal and Roman Catholic cathedrals, custom-house, chamber of commerce, town-hall, exchange, assembly-house and linen-hall. The manufactures include the curing of bacon, the preparation of butterine, and the making of army clothing. There are, besides, distilleries, breweries, tanneries, corn-mills, a patent slip for vessels of 500 tons, and a large graving-dock. Limerick is the leading port on the west coast for the shipment of raw produce. The harbor, naturally a fine one, has been improved at a considerable outlay. Pop. (1901) 45,806.

Limestone, a common and widely distributed rock, consisting essentially of carbonate of lime and varying greatly in composition, color and texture. Most limestones are of organic origin and represent the calcareous remains of sea animals, such as corals, foraminifera and mollusks. These remains may be reduced to a fine ooze by the action of the waves and in other ways, and the rock resulting from the consolidation of this ooze may show no trace of organic origin. Some limestones have been formed by the precipitation of calcium carbonate from sea water through evaporation in confined estuaries. Other limestones (travertine, calcareous tufa) have been formed by the deposition of calcium carbonate from springs, while still others represent calcareous deposits in fresh-water lakes. The varieties of limestone are almost endless, including the crytalline limestones or marbles. Thus starting with nearly pure calcium carbonate, the calcium may be replaced gradually by magnesium till finally we have dolomite, the double carbonate of calcium and magnesium. Pure dolomite contains 21.72 per cent of magnesia, but limestones containing over 5 per cent are said to be dolomitic. Again the lime may be replaced by silica, with a gradual transition from limestone through cherty limestone to pure cherts; or again iron oxide may replace lime with a resulting transition from limestone to merchantable iron ore. Besides these chemical transitions silicious or argillaceous sediments may be laid down with the calcareous material, and in the resulting rocks we may trace gradual changes from limestone through limy sandstones to pure sandstone and from limestone through marls or calcareous shales to ordinary shales. Bituminous matter may make limestone black or give rise to asphaltic varieties. Besides all these varieties of composition, limestones are often classified according to their texture, as earthy limestone, oölithic limestone with a concretionary texture, like the roe of fish, etc. Under rock stresses, with possible rise in temperature, limestones become crystalline and change to marbles. Chalk is a soft and powdery textured limestone. Limestones are also classified according to the uses to which they are put, and thus we have cement rock or hydraulic limestone used for making cement, lithographic limestone, statuary marble, etc.

The various limestones and marbles are widely used for building purposes, and a great amount of limestone is annually burnt to lime or to cement, though no statistics of the amount thus used are available (see CEMENT, LIME). Limestone is also used as a flux in smelting iron and other ores, the total amount thus used in the United States in 1902 amounting to fully 9,000,000 tons. Of the limestones used for build-

COMPOSITION OF SOME LIMESTONES.

	Silica	Alumina	Iron Oxide	Lime	Magnesia	Calcium Carbonate	Magnesium Carbonate
Coral rock, Bermuda	.....	.....	.....	53.82	1.01	96.11	2.13
Marble, Adams, Mass	0.63	.....	0.55	55.60	0.23	99.30	0.49
Bedford limestone, Indiana	1.13	.....	1.06	53.78	0.34	96.04	0.72
Lithographic stone, Bavaria	.....	.....	1.25	53.89	0.10	96.24	0.21
Hydraulic limestone, New York	15.37	.....	11.38	25.70	12.44	45.91	26.14
Fresh water limestone, Wyoming	31.28	1.83	0.22	34.20	0.11	61.07	0.23
Marl, New Jersey	43.70	10.20	18.63	9.07	1.50	.....	.....

ing purposes particular mention may be made of the buff or blue oölitic Bedford limestone of Indiana and of the marbles of Vermont, Georgia and Tennessee. Marble or limestone is also used as a source of carbonic acid gas for aërated waters. The total value of the limestone and marble produced in the United States in 1901 was fully $31,000,000. See CALC-TUFA; CALCITE; CHALK; CORAL; DOLOMITE; see also MARBLE.

S. SANFORD,
Assoc. Editor ‹Eng. and Min. Journal.›

Limicolæ, lī-mĭk'ō-lē, a group of birds, within the order *Charadriiformes,* containing the plovers, sandpipers, snipes, sheathbills, coursers, seed-snipes, stone-curlews, jacanas (qq.v.) and their immediate allies, most of which are known to gunners as «shore birds» or «beach birds», because they haunt the shore of the sea or of inland bodies of water. They are mostly small, with slender bills of varying length, grooved for the nostrils, and in some families flexible at the tip, where nerves come close to the surface and enable the bird to feel about in the mud for its food. The legs are rather long, and the toes are ordinarily quite free, as these birds run about, and do not wade or swim as a rule; some, indeed, rarely approach the water, but dwell upon dry plains. The wings are strong and the powers of flight considerable; the most extensive migrations known are performed by some of the limicoline birds. All make their nests on the ground, and many breed only in the far north; the young run about as soon as freed from the shell. Light and pleasing, but not conspicuous colors prevail, but some species display great beauty. Nearly all are edible and are the objects of skilful sport by the aid of dogs, decoys and other devices to overcome their wit and wariness. Consult Evans, ‹Birds› (Vol. I., Cambridge Natural History, 1900); Steineger, ‹Birds› (Vol. IV., Standard Natural History, 1885); Elliot, ‹North American Shore Birds› (1895); Baird, Brewer and Ridgway, ‹North American Water Birds› (1884); Sclater & Hudson, ‹Argentine Ornithology› (1888); and general works on ornithology and shooting.

Limited Liability, in modern statute law, a principle whereby the persons liable are bound under certain clearly defined conditions. The phrase is chiefly used in connection with stock companies, meaning that the stockholders shall not be called upon, under any circumstances, to contribute more than the par value of the shares of stock for which they have subscribed. If the debts of such a company, when wound up, amount to more than the resources of the company can meet, the creditors must bear the loss. In the United States shareholders in national and other banks, insurance companies, etc., are held to a specific and strict liability; in the case of the national banks, it is for twice the amount subscribed. In England the shareholders of a limited company from whose name the word «limited» is omitted must pay its debts in full. The United States Congress has adopted the rule followed by the British Parliament, and prevailing in European countries generally, with respect to the maritime law (q.v.) whereby a ship-owner, by surrender of the ship and the freight, may absolve himself from liability for negligence on the part of master or crew. Under the amended United States Revised Statutes the principle of limited liability is clearly maintained and defined as applicable in this country; wherefrom it appears that «the owner of any vessel, whether steamer or canal-boat, employed whether in seagoing or inland navigation, whether he be an American citizen or a foreigner, may obtain a limitation to the value of his interest in the vessel and her pending freight, of his liability not only for the results of a single disaster, but for the results of a disastrous voyage, including all debts due on account of the vessel save seamen's wages».

Limne'a, the central genus of the pulmonate family *Limneidæ,* containing the typical fresh-water snails. See POND-SNAILS.

Limoges, lē-mōzh, France, an episcopal city, capital of the department of Haute-Vienne, situated on a hill sloping to the Vienne, here crossed by three bridges, 88 miles west of Clermont. The fortified walls which surrounded the town have been replaced by fine shady boulevards. The principal edifices are the cathedral, commenced in 1273, presenting both Romanesque and Gothic features; the Gothic church of St. Michel des Lions; the church of St. Pierre du Queyroix; a modern town-hall, palace of justice, bishop's palace, public library, and several hospitals. The principal industry is the manufacture of porcelain; there are also wool and cotton spinning mills, cloth factories, foundries, paper-mills, and extensive shoe and clog making establishments. Limoges has a considerable trade in cereals, wine and spirits, wood, and cattle. It is the seat of courts of first resort and commerce; of a consulting chamber of commerce, lyceum, preparatory school of medicine, normal schools for male and female teachers, etc. Limoges was originally the capital of the Gallic tribe, the Lemovices, and an important city as the Roman «Augustoritum Lemovicum.» Pop. (1901) 83,569.

Limon, lē-mōn', or **Puerto Limon,** poo-ãr'tō lē-mōn, Costa Rica, Central America, a port on the northeast coast, 72 miles (103 by rail) east of San José, the capital. A railway connects with Cartago, San José, Alaguela and Puenta Arenas. The port has been greatly improved by modern docks and iron piers, and a growing export trade is carried on especially in coffee, also in bananas, rubber, mahogany, dyewood, etc. The town has ice factories, a brewery, a fine water supply, and a modern sewerage system. Pop. (1903) 4,000.

Li'monite (Greek λειμών, a meadow), an ore of iron (q.v.), varieties of which are bog iron-ore and yellow ochre. It is a hydrated oxide of iron ($2Fe_2O_3.3H_2O$), of a brownish color, occurring in mammillated or botryoidal masses, which when broken across show a fibrous radiating structure, and also in compact and earthy masses. It is opaque, rather brittle, moderately hard, and has specific gravity 3.6 to 4. It dissolves in warm aqua regia; when heated it loses water and becomes magnetic. It is a very important ore of iron, and is found abundantly in the United States, especially in Virginia and Alabama, and in other parts of America; also on the continent of Europe, and in some parts of Great Britain. In 1901 the United States produced over 3,000,000 long tons of this ore.

Lim'pet, a gastropod mollusk, with a low conical, non-spiral shell; properly a representative of the families *Patellidæ* and *Acmæidæ*. The former has no *ctenidia* or true gills, but breathe by means of a ring of special branchial filaments between the mantle and the foot; in the latter the left *ctenidium* functions as a gill and there is no accessory ring. By means of a muscular, sucker-like foot, the limpets adhere so firmly to rocks near low-water mark that they defy the beating of the heaviest surf and are difficult to detach without injury. At high-tide they move about in search of the algæ on which they feed, but are said to return to exactly the same place and position, the muscle in time wearing a smooth spot or «form» on the rock, and the shell becoming adapted to its irregularities. A widely distributed circumpolar species (*Acmæa testudinalis*) is common on the New England coast, and may be recognized by its low, conical, smooth shell with the eccentric apex slightly turned forward. In Europe limpets are utilized as food and in this country for bait. The key-hole limpets belong to the family *Fissurellidæ,* in which the shell is usually perforated like a key-hole at the apex to permit the protrusion of a process of the mantle. Numerous species occur in the littoral zone of warm seas. The *Haliotidæ,* ear-limpets or abalones (q.v.) are closely related. The cup-and-saucer limpets and slipper-limpets (*Calyptrœidæ*) have flat shells usually provided with an internal lip or shelf. Several species of *Crepidula,* having interesting commensalistic habits, are abundant on our coasts, and are known to fishermen as «half-decks.» Finally the fresh-water limpets (*Ancylus* and *Gundlachia*) belong to the pulmonate family *Limnæidæ.* Numerous species of these true air-breathing limpets are found abundantly on stones and plants in the fresh-water streams and ponds of the United States. They feed on confervæ. Limpets, especially *Acmæa* and *Patella,* are of very ancient race, having existed almost unchanged since the Silurian Age.

Limp'kin, a crane-like bird of the swamps of tropical America, known and superstitiously feared by the ignorant natives on account of its sombre plumage and wailing cry. Two species exist, *Aramus scolopaceus* and *A. pictus.*

Limpopo, lim-pō'pō, or **Crocodile River,** South Africa, a river which rises to the south of Pretoria in the Witwatersrand, flows northwest through the Transvaal, then northeast, forming for a considerable distance the northern boundary of the Transvaal, then southeast into the Indian Ocean north of Delagoa Bay; length about 1,100 miles. Its largest tributary is the Olifants, which flows through the Transvaal and joins it in Portuguese territory.

Linacre, lin'a-kėr, **Thomas,** noted English physician and scholar: b. Canterbury, England, 1460; d. London, England, 20 Oct. 1524. He was the projector of the College of Physicians in London and the founder of lectureships in both Oxford and Cambridge.

Linares, José Maria, hō-sā' mä-rē'ä lē-nä'-rēs, Bolivian statesman: b. Potosi 10 July 1810; d. Valparaiso, Chile, 1861. He was admitted to the bar, was appointed one of the commissioners to prepare a legal code for Bolivia, in 1839 became minister of the interior, later minister to Spain, and in 1848 president of the senate. In 1857 he was chosen president, but was deposed by revolutionists in January 1861.

Linares, Chile, (1) a southern province bounded north, south, and west by the provinces of Talca, Nuble, and Maule, and on the east by the Andes; area, 3,589 square miles; pop. (1895) 101,858; (2) a town, the capital of the above province, 10 miles southeast of Talca. Pop. (1895) 7,331.

Lincoln, Abraham, 16th President of the United States: b. Hardin County, Ky., 12 Feb. 1809; d. Washington, D. C., 15 April 1865. His ancestors were English Quakers, who settled in America in the 17th century. His grandfather, Abraham Lincoln, a man of property, removed from Virginia to Kentucky about 1780 with three sons. Thomas, the youngest son, learned the carpenter's trade, and married (12 June 1806) Nancy Hanks, a handsome young woman of lowly condition but possessing qualities of intellect and character above the average. From this union came three children: the oldest a daughter; the second, named Abraham; the third, a son who died in infancy. Abraham's parents were plain people, and the log-cabin they lived in was a true home. The father could not read or write (except to scrawl his signature); he was always poor, and is described as shiftless. The mother could read but not write. A woman of piety and excellent judgment, she left an indelible impress on her son. From her he inherited the serious temperament, brightened by the spirit of playfulness that was so prominent a trait of the man throughout his troubled career. She died in 1818, and the boy of 9 deeply mourned her loss. In later years he said: «All that I am, and all that I hope to be, I owe to my angel mother.»

In 1816 Thomas Lincoln sold his Kentucky farm and found a new home in a sparsely-settled district of Spencer County, Indiana. In his boyhood Abraham learned the use of fire-arms, and helped his father cut down trees. He got, all told, a year's schooling. His teachers were men who never went «beyond readin', writin', and cipherin' to the rule of three.» The boy eagerly devoured the few books that fell into his hands: the Bible, Æsop's ‹Fables,› ‹Pilgrim's Progress,› ‹Robinson Crusoe,› and the lives of Washington and Henry Clay. After he grew up he kept on reading and studying, and gained what must be considered a fair education, including Euclid and the rudiments of surveying. In childhood he had a passion for re-stating, in clear language, the confused and not over-intelligible ideas of others. In this way he acquired his unusual power of «putting things.» When a youth he practised speaking in public on temperance and political subjects.

At the age of 20, Abe Lincoln, as he was called, had grown to extraordinary stature, nearly 6 feet 4 inches, and his great muscular strength was the talk of the neighborhood. He had developed his native vein of humor, which afterward made him famous. From the life of a woodman he turned to flatboating, making a voyage down the Mississippi to New Orleans and back with one companion.

In 1830 Thomas Lincoln, who had married an estimable widow, Sarah Bush Johnston, moved to Sangamon County, Illinois. From this home he departed in a short time to Coles County, where he died in 1851. Meanwhile his son had found employment as a farm hand and railsplitter. With his rifle he supplied the family with game in the hard winter of 1830-1. In the spring of 1831 he made another flatboat trip down the Mississippi. After his return he clerked in a grocery at New Salem, and became known among his acquaintances as «Honest Abe.» In 1832 he served in the Black Hawk war, part of the time as captain of a volunteer company, but saw no fighting. Later he became a storekeeper, postmaster, and at intervals worked at surveying. He was a Whig member of the Illinois legislature eight years (1834-42), and as a legislator he made a creditable record, and through his influence the State capital was removed from Vandalia to Springfield in 1839.

Having studied law, Lincoln was admitted to the bar in 1836, and the next year began his law practice in Springfield, as partner of John T. Stuart. Among his associates in the Illinois capital were men who afterward achieved eminence in law and politics. It is enough to say that Lincoln held his own in legal combats with the best of them. In these years he met the man destined to be his political rival, Stephen A. Douglas. In 1841 he formed a new partnership with Stephen T. Logan, and from 1843 to his death was senior partner with William H. Herndon, whom he generally called Billy.

While Lincoln earned and deserved the reputation of being an able lawyer, he was never a learned jurist. His leisure was spent in general reading, history, and political economy. English grammar he had mastered by himself, and he acquired skill in composition by writing out an epitome of each book he read. Thus the young lawyer laboriously schooled himself in thinking and in the art of expressing himself clearly and correctly. In the court-room it was characteristic of him to waste no time on unessentials, but to spend his strength on the one point that was really the heart of the case. Sometimes his pleas were surprisingly short. A good illustration of his terse manner of speaking is his address to the jury in the suit against a man known as «King» Hart for seizing a piece of land from the plaintiff, Lincoln's client. The trial was held at Metamora, Woodford County. During the trial he had little to say and the case was seemingly lost, but he gained a prompt verdict by this brief speech: «We don't believe in kings in this country. We refuted that doctrine almost 100 years ago, but we have a doctrine in this country that we do believe in. It is the Monroe Doctrine. When the kings of Europe attempt to seize land in this hemisphere we apply the Monroe Doctrine to them and they experience a change of heart. Why should we not apply the same doctrine to American kings? This little king is attempting to secure possession of land to which he has no claim, and you, gentlemen of the jury, stand in the same position as the government of the United States; you must protect a weak vassal by applying the Monroe Doctrine to this American king.»

Lincoln's law practice grew and he prospered, although many of his clients were poor and fees were sometimes nothing. Success had come, but the death of his sweetheart clouded his life and deepened his melancholy. He married (4 Nov. 1842) Mary Todd, a woman belonging to an influential family of Lexington, Ky. Though a devoted wife, she was not his heart's choice. They had four sons, of whom only the eldest, Robert Todd, is living.

There is truth in the statement that Lincoln was too much of a politician to be a great lawyer. He took more than a passing interest in politics and he was quick to improve opportunities for political advancement. In the election of 1844 he «stumped» the State as the champion of the Whig party, making many speeches on the tariff question, which he had thoroughly studied. He spoke familiarly, mingling argument with anecdote and attempting no flights of oratory. His homely illustrations and striking utterances left a deep impression on his audiences. To enter Congress had long been his ambition, and in 1846 he was elected as representative from the central district of Illinois. He was the only Whig from his State, his six colleagues being Democrats. During his term (1847-9) he held with his party in favoring a protective tariff and in making appropriations for public improvements. Although opposed on principle to the Mexican War, he invariably voted for granting supplies needed by soldiers in the field. In 1858 he said (in debate with Douglas): «Whenever the Democratic party tried to get me to vote that the war had been righteously begun by the President, I would not do it.» Already he had pronounced views on the question of slavery. When a member introduced a bill to abolish the slave-trade in the District of Columbia, Lincoln proposed an amendment for the abolition of slavery in the District. He always supported the Wilmot Proviso, voting for it about forty times. He was not a candidate for re-election, but applied for the office of commissioner of lands. This position he failed to get. Instead he was offered the governorship of Oregon, which he declined.

Returning to Springfield, Lincoln resumed the practice of law. Meanwhile he closely watched the signs of the times, foreseeing trouble with the slaveholders because of their manifest intention to encroach upon the soil of the Western Territories. He was deeply stirred by the repeal of the Missouri Compromise in 1854 and entered actively into the canvass of that year. In this memorable campaign he was pitted against Stephen A. Douglas, the «Little Giant.» The first debate between the two men was at the State Fair (in October), before a vast multitude. Lincoln's speech on this occasion was regarded the ablest effort of this campaign. Its keynote is in the following passage: «My distinguished friend says it is an insult to the emigrants to Kansas and Nebraska to suppose they are not able to govern themselves. We must not slur over an argument of this kind because it happens to tickle the ear. It must be met and answered. I admit that the emigrant to Kansas and Nebraska is competent to govern himself, but I deny his right to govern any other person without that person's consent.» The second meeting of the two champions was in Peoria, and after Lincoln had finished, Douglas (as a hearer remarked) «hadn't much to say.» Thereafter the «Little Giant» kept out of the way of his antagonist. Through Lincoln's influence Lyman Trumbull, the candidate of the anti-Nebraska (afterward Republican) party, was elected United States Senator. The same year Lincoln declined the nomination for governor.

ABRAHAM LINCOLN,

SIXTEENTH PRESIDENT OF THE UNITED STATES.

In the first Republican National Convention, held at Philadelphia in 1856, Lincoln received 110 votes for the vice-presidency on the ticket with John C. Fremont. When the choice of the convention fell upon Fremont and Dayton as the standard-bearers of the new party, Lincoln entered earnestly into the campaign. His name headed the electoral ticket of Illinois. In those years Lincoln had a great reputation as a campaign speaker, and was a tower of strength to his party. The common people recognized him as a diamond in the rough and he was admired and trusted even by his enemies. His speeches were masterly and held his audiences spellbound. No other orator of the period could equal him in the rare combination of wit, argument, and dramatic power. A contemporary who saw and heard him gave this word-portrait of the man: «At rest, his features, though those of a man of mark, are not such as belong to a handsome man. . . . His head sits well on his shoulders, but beyond that it defies description. . . . It is very large and, phrenologically, well proportioned, betokening power in all its developments. A slightly Roman nose, a wide-cut mouth, and a dark complexion, with the appearance of having been weather-beaten, complete the description.»

The Lincoln-Douglas joint debate of 1858 has become historic. It was more than a contest between two rival candidates for a seat in the United States Senate. The discussion was one in which the whole nation was deeply concerned. It was a critical moment in the long-drawn struggle between North and South over slavery, and public feeling ran high. Lincoln was the strongest man in the Republican party, and Douglas was the recognized leader of the Democratic party. Lincoln threw down the gauntlet in a letter asking Douglas to divide time with him and address the same audiences in the coming canvass. Douglas was reluctant to accept the challenge, but consented to make appointments to debate with Lincoln in the several congressional districts of Illinois. «I agree to your suggestion,» he wrote (30 July 1858), «that we shall alternately open and close the discussion. I will speak at Ottawa one hour, you can reply, occupying an hour and a half, and I will then follow for half an hour. At Freeport, you shall open the discussion and speak one hour; I will follow for an hour and a half, and you can then reply for half an hour. We will alternate in like manner in each successive place.» By this arrangement Douglas had four opening and closing speeches to Lincoln's three, a distinct advantage. They appeared together before tremendous assemblages of people, at Ottawa (21 Aug.), Freeport (27 Aug.), Jonesboro (15 Sept.), Charleston (18 Sept.), Galesburg (7 Oct.), Quincy (13 Oct.), and Alton (15 Oct.). Throughout this celebrated word-duel Lincoln kept his temper and treated his opponent with courtesy and fairness, indulging in no offensive personalities. Douglas was acknowledged to be the ablest debater in Congress, and he never spoke with greater eloquence. He took with the crowd and won much applause, while Lincoln left the deeper impression. He set his hearers to thinking on and discussing the absorbing question of the day. The great difference between him and Douglas was that he took higher moral ground, in holding slavery to be a wrong. He appealed to reason and conscience. The immediate result of these debates was Douglas' election as senator. The far-sighted Lincoln looked ahead to the contest for the presidency, assured that Douglas could not win in 1860.

From this time Lincoln's reputation was national, and he received invitations to speak in other States. In May 1859, the Republican party of Illinois declared Lincoln to be its choice for the presidential nomination in 1860. In September he addressed audiences in Columbus and Cincinnati. In December he spoke at several prominent points in Kansas, making a profound impression. On 27 Feb. 1860 he visited New York and delivered his famous Cooper Union oration, followed by speeches in New England. All his utterances had a bearing on the matter of the extension of slavery. He stood forth as the defender of the right of freedom. The development of events made him the nominee of the party of freedom, when the Republican National Convention met in Chicago (16 May 1860). Hannibal Hamlin, of Maine, was nominated for vice-president. The Democrats were divided, the candidate of the Northern wing of the party being S. A. Douglas, while the pro-slavery section nominated J. C. Breckenridge. Another candidate, John Bell, was put forward by old-time Whigs and others. A combination of circumstances gave Lincoln the victory at the polls. The electoral vote stood 180 for Lincoln, 72 for Breckenridge, 39 for Bell, and 12 for Douglas.

During the four remaining months of Buchanan's administration the storm of secession gathered in the South, and the movement was promoted by the treachery of John B. Floyd, then secretary of war. A number of United States arsenals and forts in the South, with many stands of arms, were seized by State troops. The Confederate Congress, representing South Carolina, Georgia, Alabama, Mississippi, Louisiana, and Florida, met (4 Feb. 1861) at Montgomery, Ala., and chose Jefferson Davis president and Alexander H. Stephens vice-president of the seceded States. On 18 Feb. Davis was inaugurated president. Lincoln watched the course of events in silence until the eve of his departure (11 Feb.) for Washington, when he took leave of his friends and neighbors in an address that was in parts deeply religious. «I go to assume,» he said, «a task more difficult than that which has devolved upon any other man since the days of Washington. He never would have succeeded except for the aid of divine Providence, upon which he at all times relied. I feel that I cannot succeed without the same divine blessing which sustained him; and on the same Almighty Being I place reliance for support.» After visiting Cleveland, Buffalo, New York, and other cities, he passed through Baltimore in disguise, because of a plot to take his life. He reached Washington (23 February) and was inaugurated 4 March. Although an untried man, unknown to the majority of the people outside of his own State, the new President made a favorable impression and inspired confidence in his ability to cope with a serious situation. According to his position, repeatedly stated, the nation could not permanently remain half slave and half free; he expected that sooner or later slavery as an institution would disappear. How and when, he left to be settled by the logic of events. He argued that «no

n motion can lawfully get out
The members of his cabinet
ward, secretary of state; S. P.
of the treasury; Simon Cam-
war; Gideon Welles, secretary
B. Smith, secretary of the
Bates, attorney-general; Mont-
stmaster-general. In January
Stanton succeeded Cameron,
other changes in the cabinet
Velles, and Stanton were con-
his second administration.
incoln's life the next four years
e history of the Civil War.
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n effective army but was slow
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rew impatient at his long de-
h 1862) he was relieved from
though retaining command of
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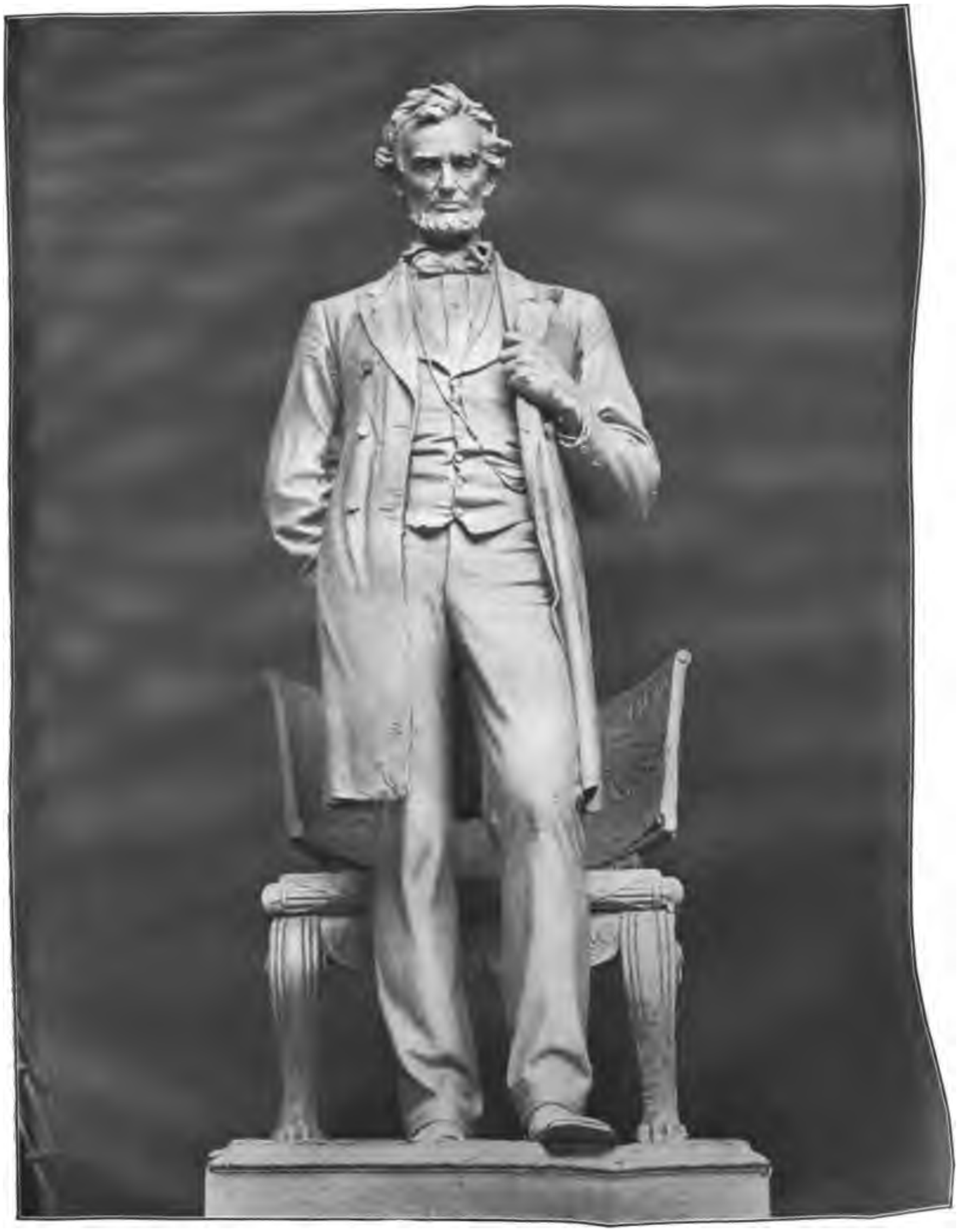
S. Grant, in co-operation with
e, captured Forts Henry and
e little Monitor had worsted
n the spring and summer the
ere successful at Shiloh, New
Hill, and Antietam. The second battle of Bull Run and the battle of Fredericksburg were lost. On the whole, progress had been made, notwithstanding many blunders on the part of Northern generals. The President, not being a military expert, had also made mistakes of judgment in directing the movements of troops. The end of the struggle seemed far off.

On 1 Jan. 1863 the Emancipation Proclamation, freeing the slaves, went into effect. Congress had previously passed a bill abolishing slavery in the District of Columbia, and slavery had been prohibited in the Territories. Volunteers of African descent were enlisted, and on 22 Sept. 1862 the President's preliminary proclamation announced that in territory still in rebellion (1 Jan. 1863) slaves would be declared forever free. The act of emancipation was a military necessity. In his message to Congress (1 Dec. 1862) Lincoln recommended that loyal owners be compensated. Before the Thirty-seventh Congress adjourned (4 March 1863) it empowered the President to suspend the writ of *habeas corpus* and authorized the loan of $300,000,000 for carrying on the War in 1863. The number of Union soldiers on duty was about 700,000, and a call for 300,000 more was issued (17 October). From time to time more treasure and men were forthcoming, as the country gradually realized the magnitude of the conflict. The campaigns of 1863 resulted in great gains to the North, the most notable victories being at Gettysburg (1–3 July), Vicksburg (4 July), and Chattanooga (25 November). The battle of Gettysburg has been called the turning-point of the war. A portion of this field was set apart (19 November) for a national cemetery, and at the dedication Lincoln delivered an address so compact and felicitous in thought and statement that it has become a classic. His thanksgiving proclamation of this year was marked by lofty sentiment and rare beauty of language.

Henceforth the South waged a losing fight. Grant took chief command (10 March 1864) as lieutenant-general and won the hard-fought battles of the Wilderness (5–6 May), Spottsylvania (10 May), and Cold Harbor (3 June). Sherman took Atlanta (2 September) and Savannah (21 December). Decisive blows were struck by Farragut, Sheridan, Thomas, and other Federal commanders. At the National Republican Convention, which met at Chicago in June 1864, Lincoln was renominated on the first ballot; Andrew Johnson, of Tennessee, was nominated vice-president. The overwhelming majority for Lincoln on election day showed conclusively that the people were with him. His second inaugural (4 March 1865) justly ranks as the greatest of his public utterances. The war was all but ended, there being one more battle, Five Forks (1 April), before Lee's surrender at Appomattox (9 April). The rejoicing of the nation was suddenly turned to mourning when the President was shot in Ford's Theatre, Washington, on the evening of 14 April, by John Wilkes Booth. He lingered unconscious and died the next morning. His remains, after lying in state in the Capitol, were borne to Springfield and there buried (4 May). His tragic end as well as his public services had gained him a place in the hearts of his countrymen not second to that of Washington, and in the estimation of



STATUE OF ABRAHAM LINCOLN, BY SAINT-GAUDENS.

IN LINCOLN PARK, CHICAGO.

many he was and is regarded as the greatest of Americans.

Consult: Lincoln's complete works, edited by Nicolay and Hay (2 vols. 1894); lives by O. J. Victor (1864), L. P. Brockett (1865), H. J. Raymond (1865), J. G. Holland (1866), W. O. Stoddard (1884), I. N. Arnold (1885), Nicolay and Hay (1890), Carl Schurz (1891), J. T. Morse (1893), N. Brooks (1894), N. Hapgood (1899), I. M. Tarbell (1900), W. E. Curtis (1903); also reminiscences by A. T. Rice (1886), F. F. Browne (1886), H. C. Whitney (1892), W. H. Herndon (1892), and W. H. Lamon (1895).

Eugene Parsons,
Author and Editor.

Lincoln, Benjamin, American general: b. Hingham, Mass., 24 Jan. 1733; d. there 9 May 1810. Until the age of 40 he followed the calling of a farmer, holding also at different times the offices of magistrate, representative in the provincial legislature, and colonel of militia. He was also an active member of the three provincial congresses of Massachusetts, and as militia officer displayed an efficiency which procured his promotion in 1776 to the rank of major-general. In this capacity he became favorably known to Washington during the siege of Boston. In the beginning of 1777 he joined Washington at Morristown with a new levy of militia, and soon after, at the suggestion of the commander-in-chief, was transferred to the continental service with the rank of major-general. He was sent to join the forces assembled to oppose the progress of Burgoyne and during the battle of Bemis' Heights commanded inside the American works; and was severely wounded in the leg, and compelled for nearly a year to retire from service. In September 1778 he was appointed to the command of the southern army, and upon the arrivel of Count d'Estaing cooperated with the French troops and fleet in the unsuccessful assault on Savannah. From the unwillingness of his allies to continue the siege he was obliged to return to Charleston, where in the spring of 1780 he was besieged by a superior British force under Sir Henry Clinton. After an obstinate defense he was forced in May to capitulate, and retired to Massachusetts on parole. In the spring of the succeeding year he was exchanged, and subsequently participated with credit in the siege of Yorktown. In consideration of his merits and misfortunes Washington appointed him to receive the sword of Cornwallis upon the surrender of the British forces. He held the office of secretary of war 1781–3, and in 1787 commanded the forces which quelled the Shays' Rebellion in western Massachusetts, and in the same year was elected lieutenant-governor of the State, which office he held one year. He was collector of Boston 1789 till about two years before his death. He was a member of the commission which in 1789 formed a treaty with the Creek Indians, and of that which in 1793 unsuccessfully attempted to enter into negotiations with the Indians north of the Ohio. See life by Bowen in Sparks' 'American Biography' (2d series, Vol. XIII., 1847).

Lincoln, Charles Perez, American lawyer: b. Quincy, Mich., 7 Oct. 1843. He was educated at Hillsdale College; entered the Union army at the beginning of the Civil War, and served until mustered out of the service in June 1864. He was admitted to the bar in 1871; was consul at Canton, China, 1875–81, and then began to practise his profession in Washington. He was elected commander of the Department of the Potomac, G. A. R., in 1888; and was 2d deputy commissioner of pensions 1889–93.

Lincoln, David Francis, American hygienist: b. Boston, Mass., 4 Jan. 1841. He was graduated at Harvard University in 1864 and at its medical school in the same year; and served as acting assistant surgeon in the United States navy during part of the Civil War (1864–5). He has published 'Electro-Therapeutics' (1874); 'School and Industrial Hygiene' (1880); 'Hygienic Physiology,' a school text-book (1893); 'Sanity of Mind' (1900), etc.

Lincoln, Jeanie Gould, American novelist: b. Troy, N. Y. She was married in 1877 to N. S. Lincoln of Washington, D. C., and has published 'A Chaplet of Leaves,' verse (1869); 'Marjorie's Quest' (1872); 'Her Washington Season' (1884); 'A Genuine Girl' (1896); 'An Unwilling Maid' (1897); 'A Pretty Tory' (1899).

Lincoln, Mary Johnson Bailey, American household economist: b. South Attleboro, Mass., 8 July 1844. She was educated at Wheaton Seminary, Norton, Mass., in 1864, was married to David A. Lincoln (now dead) in 1865, and since 1879 has been prominent as a lecturer and writer on household matters. She was the first principal of the Boston Cooking School, and is the culinary editor of the 'American Kitchen Magazine.' She has published 'The Boston Cook Book' (1884); 'Peerless Cook Book' (1886); 'Carving and Serving' (1886); 'The Boston School Kitchen Text Book' (1888).

Lincoln, Robert Todd, American diplomatist: b. Springfield, Ill., 1 Aug. 1843. He is the eldest son of Abraham Lincoln, and was graduated at Harvard College in 1864. He entered the Harvard Law School, but left it for the army and served on the staff of General Grant as captain. On the close of the War he resumed his legal studies and was admitted to the Chicago bar in 1867. He was secretary of war 1881–85; and although mentioned as a candidate for the presidency in the last-named year declined to allow his name to be placed in opposition to that of President Arthur. He was minister to Great Britain in 1889–93, and became president of the Pullman Palace Car Company in 1897.

Lincoln, England, an episcopal city and civic county, the capital of Lincolnshire, on the Witham, at the junction of several railroads, 120 miles north of London. It dates from pre-Roman times, was the Roman 'Lindum Colonia,' and at the time of the Norman Conquest, a fortified town of considerable importance. The principal edifice is the cathedral, crowning a height, on the summit and slope of which the town is built, 200 feet above the river. The cathedral dates from the 11th century and is chiefly early English but with interesting transitional phases, which are also to be seen in the various parish churches, the majority of which have undergone modern restoration. Other prominent buildings are the mediæval guildhall, the remains of the Norman castle, the ancient episcopal palace, the fine old Roman gateway spanning Hermin street, a theological college, school of art, and several benevolent institutions. The manufacture of machinery and agricultural implements forms the chief branch of industry. Pop. (1901) 48,784.

Lincoln, Ill., city, county-seat of Logan County; on the Illinois Central, the Peoria, D. & E., and the Chicago & A. R.R.'s; about 28 miles northeast of Springfield and 135 miles southwest of Chicago. The place was settled in 1835 and incorporated in 1865. It is situated in an agricultural region, and extensive deposits of coal are in the vicinity. The chief manufactures are cellulose, horse-collars, flour, mattresses, caskets and coffins, excelsior. The farm and dairy products and the coal mines contribute to the wealth of the city. Lincoln is the seat of the State Institution for Feeble-Minded Children; and of the Lincoln University, opened in 1865 under the auspices of the Cumberland Presbyterians. It has a free public library, the building a gift from Andrew Carnegie; a Deaconess Home and Hospital, Saint Clara's Hospital and Odd Fellows' Orphans' Home. Pop. 1890) 6,725; (1900) 8,962.

Lincoln, Kan., city and county-seat of Lincoln County; on the Saline River, and on the Union Pacific railroad; about 155 miles west of Topeka and 105 miles west of Wichita. It is in an agricultural region in which are raised large quantities of wheat and corn and a number of cattle. Limestone quarries in the vicinity contribute to the industrial wealth of the city. The industries and trade are connected chiefly with farm and dairy products and with live-stock. Pop. (1900) 1,262.

Lincoln, Neb., city, capital of the State and county-seat of Lancaster County; on the Chicago, B. & Q., the Chicago, R. I. & P., the Union P., the Missouri P., the Chicago & N. W., and other railroads; about 55 miles west of the Missouri River, and about the same distance north of the Kansas State line. The city, located in the midst of a fertile agricultural district, in the Salt Creek basin, at an elevation of 1,045 feet, rises gradually to the south and east, leaving the creek to the west and north. The location of the capital at this point was due in part to the numerous radiating branches of Salt Creek, but more especially to the saline springs which in early days furnished salt to the Indians and the buffalo, and later to the overland emigrants, and the early settlers of Nebraska. The site selected by a commission, 14 Aug. 1867, was surveyed the same fall; and, from the proceeds of lots sold at auction, the first capitol, the insane asylum, and the original university building were erected and completed by 1871.

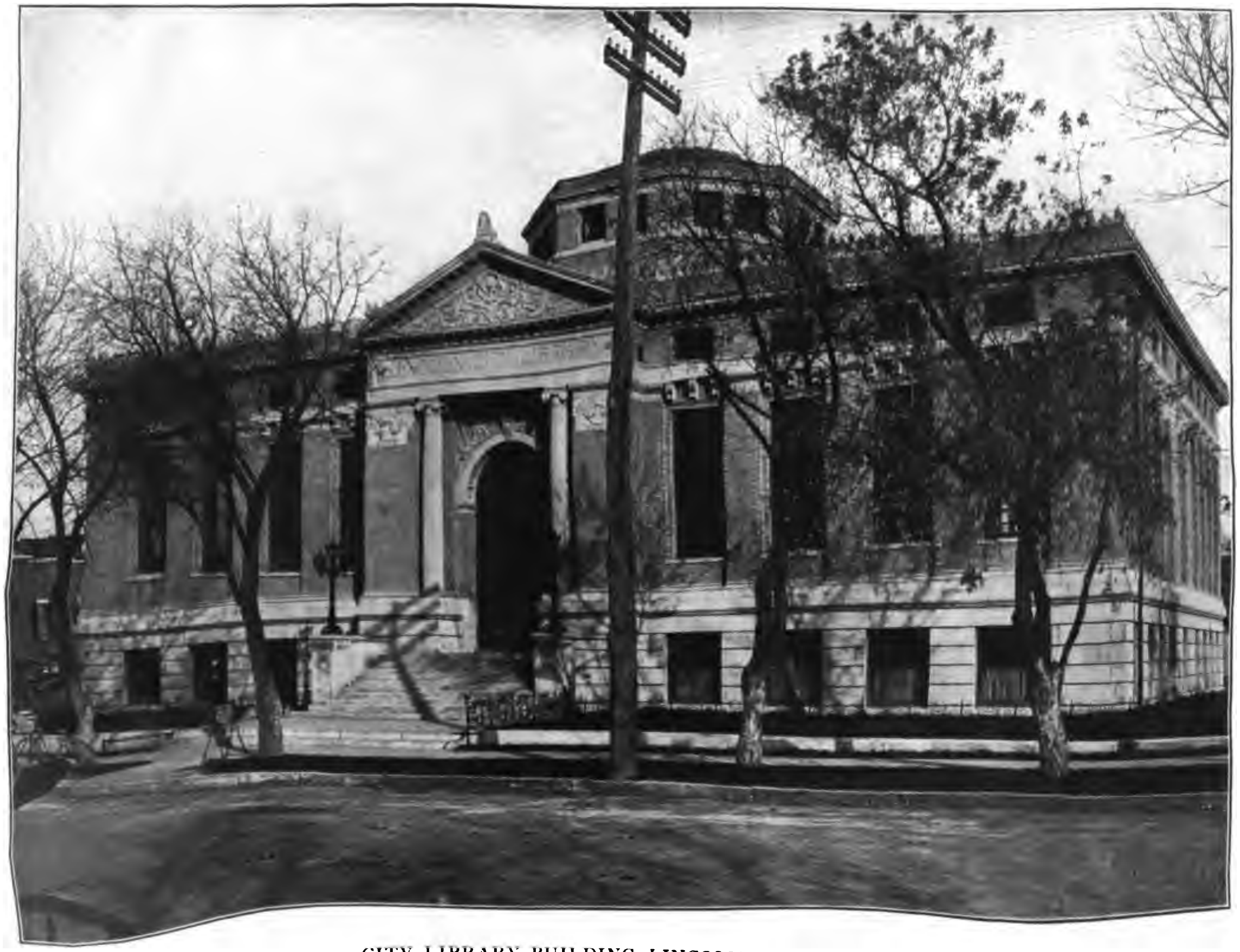
Lincoln bids fair to fulfil the prediction of its founders by becoming a great railroad centre, as it already has 12 radiating lines, owned by five of the great corporations that now dominate in the West as already mentioned. With one exception each railroad has its own station and yard. The Chicago, B. & Q. repair and construction shops, employing 500 skilled mechanics, are located at Havelock, a suburb of Lincoln. Thirty-eight passenger trains enter, and the same number leave, Lincoln every 24 hours. Lincoln's railroad connections make it the great convention centre of the State.

The Name.— The names of Lincoln and Douglas are strangely associated in Nebraska history. The site selected for the capital in 1867 and named Lincoln is practically identical with the one proposed 10 years earlier to have been called Douglas. Thus the author of the law organizing the Territory of Nebraska failed to have his name perpetuated in its capital, but yielded that honor to his great rival.

Internal Appearance.— Lincoln is laid out, like most western cities, on the checker-board plan, with streets 100 or 120 feet in width. These broad streets are in general lined with trees and flanked with large lawns. The city contains an unusually large number of comfortable homes, excelling in this respect its development in business blocks. About 20 miles of the streets are paved — 12.2 miles with brick, 3 miles with asphalt, and 5 miles with nearly worn-out cedar blocks. The waterworks are owned by the city; 50 miles of mains distribute the water from two deep wells, from which about 1,500,000 gallons of the very purest water are pumped per day. There are 40 miles of sanitary and 6 miles of storm-water sewers in the city.

The Lincoln Traction Company operates 37 miles of tracks, furnishes heat through conduits to the central section of the city, electric power and lights to public and private consumers, employs 100 men, and is capitalized at $1,000,000. The following statistics suggest the character of the Lincoln Gas and Electric Light Company: 260,000 feet gas mains, 262,000 feet electric wire lines, 200 employees, and a capitalization of $2,250,000. There are two telephone systems: one — «the Nebraska,» in operation with 3,500 phones in use, and 140 employees; the other — «The Lincoln» (automatic), begins service 1 Jan. 1904, with 3,000 subscribers, and an investment of $400,000. The city uses for municipal lighting 314 gas lights and 27 electric arcs.

Industries.— Manufacturing is of course yet in its infancy, but the total output per year will approximate $5,000,000; in 1900 by United States census, $4,105,951. A few industries are however well established. The making of leather goods, such as horse-collars, harness, etc., is not equaled west of the Missouri River. The production of oils and paints, mattresses and bed-springs, overalls and shirts, is large and developing rapidly. A large butter and creamery station is located at Lincoln. It receives cream from some 200 sub-stations, and makes two car-loads of butter per day. The jobbing and wholesaling industry is well under way, and in a few lines has reached creditable proportions. Lincoln, with 22 branch houses, is the largest distributing centre for farm machinery in the West. The jobbers in butter and eggs, fruits and groceries, are doing a good business. There is also a fair beginning in hats, hardware, drugs, furniture, coffins, paper, sash and doors, iron for plumbing, jewelry, crockery and queensware, lumber and coal. Two fair-sized grain elevators have recently been constructed. Total estimated business of jobbers and wholesalers for 1902, $18,000,000. Lincoln is also becoming quite a centre for insurance business. Two strong life insurance companies, two fire insurance, three fraternal companies, including the Modern Woodmen with head-



CITY LIBRARY BUILDING, LINCOLN, NEBRASKA.

quarters here, and several mutual companies indicate the scope of development.

The banking capital is small for a city of its size: five commercial banks, capital $500,000, surplus $180,000, and deposits $5,115,000, and one savings bank, deposits $140,000, supply the business community.

Public Institutions.— The State fair grounds, the penitentiary, one of the insane asylums, and the Home of the Friendless are located in or near the city. The other public buildings are: the Capitol, costing $750,000; the county courthouse, $200,000; the United States post-office, $150,000. The post-office becomes the city-hall, at a cost to the city of $50,000, on the completion of the new Federal building for which Congress has appropriated $350,000. The Carnegie library, $75,000 and the grounds; 19 public school houses that cost from $15,000 to $50,000 each. Saint Elizabeth's Hospital, $150,000, the Catholic Orphans' Home, and the Tabitha Home,— private institutions,— aid in caring for the sick and unfortunate. The mineral waters are used in several private sanitariums.

Amusements.— Outdoor — one small public park, the university athletic field, the Epworth Assembly park, and the «Country Club» grounds afford meagre facilities. The city supports one theatre and an auditorium.

Government.— The charter, granted by the legislature, contains no marked elements of interest. A mayor with large powers, a council of one house, and an excise board of three members, with the usual executive officials, control the city's public affairs. Taxes are 10 mills on the dollar of assessment, the last valuation showing the wealth of the city to be $22,380,834. The total bonded debt is $1,169,100, excluding about $220,000 of paving bonds payable by abutting private property.

Education.— Lincoln is at present rather an educational than a business centre. Its population is largely American, representative of the North and Middle West. Neither great wealth nor extreme poverty is found. The public schools are efficient, and enroll 6,210 students. The high school employs 36 teachers, and registers 1,090 pupils, a number claimed to be unsurpassed by any city of its size. There are three musical conservatories, three universities, three colleges, one preparatory school and two parochial high schools, which tend to give a distinct educational tone to the public as well as private life of the city. The largest and most important educational institution is that of the State University and Agricultural College (q.v.). The campus contains 12 acres, and 8 buildings; there are two more under construction at cost of $110,000. The farm of 320 acres has barns, dairy buildings, recitation halls, besides new buildings in course of construction, at a cost of $100,000. (The legislature of 1903 appropriated in all $824,000 for the biennium.) The calendar of 1902-3 shows 2,560 students in attendance. The Wesleyan University (q.v.), situated in University Place, a suburb of Lincoln, ranks next in importance, and enrolled 1902-3, 650 students. A third building is in course of construction. Union College (q.v.), a Seventh Day Adventist school, with three buildings and over 400 students, and Cotner University (q.v.), controlled by the Christian Church, with one good building and 200 students, are prospering. The conservatories and other schools add several hundred more students to this list. The public libraries are: the University, 60,000 volumes; the State, 40,000; the City, 15,000; and the high school, 2,500. Lincoln's educational output is indicated in the second-class mail matter sent through its post-office. One per cent of all the second class mail matter of the United States originates in Lincoln. It requires 75,000 mail sacks to carry this matter for one year. In 1902 4,894,835 pounds of second class mail matter left the city. In all 66 publications are entered, one with 750,000 circulation, two others with about 150,000 each, and a fourth with over 100,000.

Religion.— There are 30 church buildings in Lincoln. The following organizations are represented: Methodists, 3 organizations; Congregational, 8; Presbyterian, 3; Christian, Baptists, Lutheran, Episcopal, Catholic, 2 each; United Presbyterian, Jews, Christian Science, Unitarian, Reformed, Swedish, Free-will Baptists, and several minor denominations, 1 each. There are 3 colored churches. The leading denominations all have exceptionally fine buildings.

Population.— Lincoln's growth has been somewhat irregular, yet counting decades gradual, Lincoln in 1867 — then called Lancaster — contained only one store and some half-dozen dwellings. By 1870 it contained 2,441 people. In 1880, 13,004. The padded census of 1890 gave the city 55,154 population — a number too large by at least 20,000. In 1900 it had 40,169, and has grown rapidly since.

Howard W. Caldwell,
Of the University of Nebraska.

Lincoln, Mount, one of the peaks of the Rocky Mountains; about 8 miles northeast of Leadville. Its height is 14,297 feet. A meteorological station is on the summit, and another on the lower level (13,500 feet). A railroad has been constructed to the silver-mining works at the summit.

Lincoln College, established at Lincoln, Ill., in 1866, under the auspices of the Cumberland Presbyterians. It has a preparatory department, and the college courses lead to the degrees of A. B., B. S., and B. L. In 1903 there were connected with the college 12 professors and instructors and 200 students. The library had about 3,500 volumes; the grounds, buildings, and apparatus were valued at nearly $80,000; the productive funds were $65,000; and the income from productive funds, tuition, and other fees, amounted to about $6,000.

Lincoln Memorial University, a coeducational institution, at Cumberland Gap, in Claiborne County, Tenn. The university was chartered in 1897, but was not opened until the buildings were in such a condition as to accommodate pupils. The situation of Cumberland Gap (q.v.) makes it easy of access for students from Tennessee, Virginia, and Kentucky, and it is not far distant from West Virginia and North Carolina. Prior to the opening of this school there was within a radius of 50 miles fully 250,000 people without any well-equipped college, and except in a few places, no well equipped elementary school. The plan of the work is to maintain an institution which «shall promote research, investigation, and experiment for the extension and application of knowledge, and shall impart such instruction in the various branches of education as will tend to promote good society and good citizenship, and the ability to develop the abundant resources of the Southern States.» The plan of erecting such a school was first started by Gen. O. O. Howard, of Burlington, Vt., who desired to see a school established some place easy of access for the mountaineers of this locality, because of the great interest which Abraham Lincoln had in the people of this section. The institution comprises three departments: the academic, the normal, and the industrial. There are several grades in the academic department. In the normal department teachers are trained; and in the industrial department, agriculture, carpentry, masonry, typesetting, and other trades, are taught to the boys and young men, and domestic science to the girls and young women.

The university owns 600 acres, and the buildings cost $150,000. They include class rooms, saw-mills, shingle-mills, shops, etc. Andrew Carnegie contributed $13,800. The present endowment fund is $200,000. By working for the school in some of the industrial departments, the students can earn their tuition and board, or at least a part of the cost of their education.

Lincrusta-Walton. See Linoleum.

Lind, Jenny (Madame Goldschmidt, gōld'-shmĭt), Swedish singer: b. Stockholm 6 Oct. 1820; d. Malvern, England, 2 Nov. 1887. In very early childhood she displayed the faculty of tune and of musical memory in such degree as to attract observation, and at 9 her voice was considered so remarkable that she was admitted to the Stockholm Conservatory of Music as a pupil of Crœlius and Berg. In spite of an apparent lack of individual attractions, which led the manager of the court theatre at first to demur, when he had heard her sing she was entered at the vocal school there, made rapid progress, and up to the age of 12 was frequently heard on the local stage. After years of thorough study and voice-building, in 1838 she made her debut, with great success, as Agathe in ‹Der Freischütz.› As operatic star in Stockholm and other cities in Sweden and Norway, she extended her fame, and in 1841 studied for the greater part of the year in Paris under Manuel Garcia. She went to Berlin in 1844, studied German, and in Meyerbeer's ‹Feldlager in Schlesien› appeared as Vielka. During the next year she made a Continental tour which established her in a position of supremacy, her great successes being won in Dresden, Leipsic, etc., and finally in Vienna. In 1847 she made her first appearance in England, which was followed by a succession of unprecedented triumphs. Her tour of the United States (1850–2) brought her not only fresh honors, but also large financial returns, and is remembered to this day by many who shared in the material and spiritual benefits which her noble womanhood and artistic genius conferred. In 1852 she was married in Boston to Otto Goldschmidt (q.v.), then conducting the Bach choir, and virtually retired from her profession, though subsequently reappearing on special occasions. She returned to Europe; at length settled in London; and made her last public appearance at Düsseldorf in 1870. In 1894 a bust of her was unveiled in Westminster Abbey. Consult: Rockstro and Holland, ‹Jenny Lind the Artist› (1891); Rockstro and Goldschmidt, ‹Jenny Lind, Her Vocal Art and Culture› (1894).

Lindau, lĭn'dow, **Paul,** German author: b. Magdeburg 3 June 1839. He studied philosophy and literature at Halle, Paris, and elsewhere, in 1872 established ‹Die Gegenwart,› a weekly literary and political journal, and in 1878 ‹Nord und Süd,› a monthly. Among his earliest works were pleasantly written books of travel, ‹Venice› (1864), ‹Paris› (1865), and later ‹The New World› (1884). But he is better known as a playwright and novelist, his subjects being taken almost exclusively from modern life. The most successful of his plays was possibly ‹Maria and Magdalena.› His novels include: ‹Herr und Frau Bewer›; ‹Toggenburg› (1883); ‹Mayo,› a romance cycle; ‹Berlin› (1886–90); and ‹The Brothers› (1894). In 1895 he became manager of the court theatre at Meiningen.

Lin'den, or **Basswood,** a genus of trees (*Tilia*) of the order *Tiliaceæ*, ordinarily known as basswoods in the United States. The species, of which there are about a dozen, are natives of the northern temperate zone, and more or less resemble each other in general appearance. They are characterized by alternate, usually heart-shaped, leaves with toothed edges; small yellowish, often fragrant, flowers in cymes; the peduncles of which are attached to membranous bracts; and globular nut-like fruits about the size of peas. The trees, in many horticultural varieties, are widely planted in Europe, where they are known to the English as limes, and have been introduced into America for their pleasing form and dense shade, and to some extent also because of their abundant yield of nectar, from which bees make one of the finest qualities of honey. They are also planted for their timber, usually called «whitewood,» which is highly valued on account of its whiteness, lightness, toughness, and durability, and is used for turned and carved ornaments, and for making honey-boxes and other light articles the whiteness of which is desired to enhance the appearance of the goods they contain; also extensively used for carriage bodies, cabinet work, and interior parts of furniture. It makes a high grade of charcoal, used by druggists, gunpowder-makers, and artists. The fibrous inner bark is made into mats and cordage, and strips of it are widely used for tying plants, etc. When stock-food is scarce in early spring the twigs and budding shoots are often fed to farm animals, being very mucilaginous and nutritive, though liable, it is said, to injure the quality of butter made from the milk of cows fed upon them. The best-known species are the American basswood (*T. americana*), a stately tree often exceeding 75 feet in height and 10 feet in girth. Its range extends from New Brunswick to Minnesota and southward to the elevated lands of Georgia and Texas. In the more thickly settled parts of this region it is becoming scarce as a timber tree because of the great demand for its wood. In America it is the most frequently planted species. Owing to confusion in nomenclature, the name «European linden» is applied to at least three species, *T. platyphyllos*, *T. vulgaris*, and *T. ulmi-*

folia. The first is most widely planted in America. The last is very late in blossoming and should be more extensively cultivated in order to extend the season of honey production. Lindens all thrive best upon good land. They are easily propagated from seeds, layers, and grafts, and by «stooling,» the small trees being cut down close to the ground, the sprouts covered with soil, and when rooted removed to nursery rows.

In some countries the fibrous inner bark of the linden is separated by soaking in water, and manufactured into fishing-nets, mats, shoes, and clothing; and the cordage made from it is said to be remarkably strong and elastic. (See Bast.) The wood is sometimes cut into thin strips and used in the manufacture of chip hats, which resemble those made of straw.

Lindley, lĭnd'lĭ, **John,** English botanist and horticulturist: b. Catton, near Norwich (Norfolk), 5 Feb. 1799; d. Acton 1 Nov. 1865. He became Belgian agent for a London seed merchant in 1815, later took up botanical studies, published in 1819 a translation of Richard's ‹Analyse du Fruit,› and was appointed assistant librarian to Sir Joseph Banks at London. Later, he was successively made assistant secretary to the Horticultural Society (1822–41), professor of botany in the University of London (1829–60), and lecturer in botany to the Apothecaries' Company (1836–53). In 1828 he was elected to the Royal Society, whose royal medal he received in 1857, and in 1853 became a corresponding member of the Institut de France. He was appointed editor of the ‹Botanical Register› in 1826, of the ‹Journal of the Horticultural Society› in 1846; and in 1841 was a founder of the ‹Gardeners' Chronicle,› whose chief editor he was until his death. He was an able lecturer, a constant opponent of the Linnæan as contrasted with the natural system of classification, and the author of several valuable works such as: ‹The Theory and Practice of Horticulture› (1842), and ‹The Vegetable Kingdom› (1846). He also wrote almost the entire descriptive portion of London's ‹Encyclopædia of Plants› (1822–9).

Lindsay, lĭn'zā, **Anna Robertson Brown,** American author: b. Washington 20 Feb. 1864. She was graduated from Wellesley in 1883, subsequently studied mediæval literature at Oxford University, and was married to S. M. Lindsay (q.v.) in 1896. She has published: ‹What is Worth While?› (1893); ‹The Victory of Our Faith› (1895); ‹Culture and Reform› (1896); ‹Giving What We Have› (1897); ‹What Good Does Wishing Do?› (1898); ‹The Warriors› (1903).

Lindsay, or **Lyndsay,** lĭnd'zā, Sir **David,** Scottish poet, usually described as «of the Mount» (an estate near Cupar in Fife): b. about 1490; d. 1555. He studied in the University of St. Andrews, and in 1509 became page of honor to James V., then an infant. In 1528 he produced his ‹Dreme,› and in the following year presented his ‹Complaynt› to the king. In 1530 he was inaugurated Lyon king-at-arms, and knighted, and in 1531 sent on a mission to Charles V. He published a drama entitled ‹A Satyre of the Three Estatis,› played at court in 1539, and followed in 1536 by his ‹Answer to the King's Flyting›; and by the ‹History and Testament of Squire Meldrum› (1538). His last work, ‹The Monarchie,› was finished in 1553. For more than two centuries Lindsay was the most popular poet in Scotland. His satirical attacks on the clergy in some degree paved the way for the Reformation.

Lindsay, Harry. See Hudson, H. L.

Lindsay, Samuel McCune, American political economist and educator: b. Pittsburg, Pa., 10 May 1869. He was graduated from the University of Pennsylvania in 1889, and took post-graduate courses there and abroad. After his return to the United States he was appointed assistant professor of sociology at the University of Pennsylvania; he has also been editor of the department of sociological notes in the ‹Annals of the American Academy of Political and Social Science› (1895–1901), and associate editor of the ‹Annals.› In 1892 he was special agent of the United States Senate Finance Committee to report on wholesale prices in Europe; in 1899–1900 was expert of the Industrial Commission to report on railroad labor; and in 1902 was appointed commissioner of education to Porto Rico, being granted leave of absence from the University of Pennsylvania. He has written ‹Railway Labor in the United States› (1902); ‹Social Work at the Krupp Foundries›; ‹The Study and Teaching of Sociology›; ‹The Unit of Investigation in Sociology›; and other articles in the ‹Annals of the Academy of Political and Social Science›; ‹Report on Education in Porto Rico›; and other monographs.

Lindsay, William, American lawyer: b. Rockbridge County, Va., 4 Sept. 1835. He was educated in his native State; removed in 1854 to Clinton, Hickman County, Ky., where, after teaching school and studying law, he was admitted to the bar in 1858. Throughout the Civil War he served in the Confederate army, rising to the rank of captain and acting as a staff officer, and after the war returned to Clinton and resumed the practice of law. In 1867 he was elected State senator as a Democrat; in 1870 took his seat on the bench of the supreme court of Kentucky; and was chief justice of the State 1876–8, declining a renomination and returning to the practice of law at Frankfort. In 1889 he again entered the State senate; in 1893 served as commissioner of the World's Columbian Exposition; in the same year was elected to the United States Senate for the unexpired term of John G. Carlisle, who had resigned to become secretary of the treasury; and in 1894 he was re-elected, but differed from his party on the money question, and toward the end of his term usually voted with the Republicans. After leaving the Senate he went to New York city and once more resumed the practice of law. In 1901 he was appointed by President McKinley a commissioner for the Louisiana Purchase Exposition at Saint Louis.

Lindsay, Canada, the capital of Victoria County, Ontario, a town and port of entry on the navigable Scugog River, and on the Grand Trunk railway, 57 miles northeast of Toronto. The town is well built, chiefly of brick, has a large trade in lumber and grain, and is the seat of a United States consular agent. It has lumber- and flour-mills, foundries, tanneries, breweries, and manufactories of carriages, agricultural implements, sash, doors, and blinds, woolens, boots and shoes, woodenware, etc. Lindsay has fine county buildings, schools, and churches, banks, and weekly newspapers. Pop. (1901) 7,003.

Lindsey, lĭn'zĭ, **William,** American merchant and author: b. Fall River, Mass., 12 Aug. 1858. He has published ‹Apples of Istakhar› (1895), a volume of poems; and ‹Cinder-Path Tales› (1896), stories of athletic sports.

Lindsborg, lĭnz'bôrg, Kan., city in McPherson County; on the Smoky Hill River, and on the Missouri Pacific and the Union Pacific R.R.'s; about 115 miles southwest of Topeka, and 64 miles north by west of Wichita. It is in an agricultural region, and its trade is chiefly in live-stock, grain, broom-corn, flour, and dairy products. It has large brick and lumber yards and grain elevators. An important industrial establishment is the Bethany Book Concern, the Western publishing institution for Lutheran literature. There are a number of Swedish Lutherans in Lindsborg. It is the seat of Bethany College, opened in 1881 under the auspices of the Lutherans. Among its departments, that of music is well known for its annual concerts, when the students render the ‹Messiah.› Pop. (1900) 1,279.

Lindsley, lĭnz'lĭ, **John Berrien,** American educator: b. Princeton, N. J., 24 Oct. 1822; d. 7 Dec. 1897. He was graduated from the University of Nashville in 1839 and received his degree in medicine at the University of Pennsylvania. Studying theology, he was ordained to the Presbyterian ministry in 1846 and preached for several years. He became professor of chemistry in the University of Nashville in 1850, and was chancellor of the institution 1853–73. He was likewise professor of chemistry in the University of Tennessee 1880–97, and of materia medica in the Tennessee College of Pharmacy 1896–7. He published ‹Our Ruin: its Causes and Cure› (1868); ‹The Military Annals of Tennessee› (1886).

Line, Mathematical. In geometry, a line may be defined (1) as the locus described by a moving point; (2) as a magnitude which, at each of its points, has extension in one direction only; (3) as the boundary which separates two contiguous parts of a surface; or (4) as the intersection of two surfaces, or of a surface with itself. Each of these definitions has its own merits, and geometers use one or another of them, according to convenience.

In physics, «lines» of various kinds are constantly referred to, the context usually indicating the sense in which the word is used. A «line of force,» in a field of electric or magnetic force, for example, is a line whose direction, at every point, coincides with the direction of the force at that point. In the mechanical theory of heat (see THERMODYNAMICS) the state of a homogeneous body, with respect to its temperature, to the pressure exerted upon it, and to the volume occupied by a unit of its mass, is often represented by means of a diagram in which two of these quantities are taken as abscissa and ordinate, respectively. In such a diagram an «isothermal» line is a line along which the temperature of the body remains constant; an «adiabatic» (or «isentropic») line is one which is so drawn that if the body should pass through the succession of states that the line represents it would not at any moment either absorb or emit heat. An «isopiestic» (or «isobaric») line is a line along which the pressure to which the body is exposed remains constant. An «isometric» line is one along which the volume of the body remains constant.

In steam engineering the various parts of the diagram that is drawn by an indicator are designated as «lines,» although they are but the several parts of a single line. Thus the «admission line» is that part of the diagram which the indicator draws while steam is being admitted to the cylinder; the «expansion line» is that part drawn while the steam in the cylinder is expanding; the «exhaust line» is that part drawn while the cylinder is in free communication with the atmosphere (or with the condenser); and the «compression line» is that part which the indicator draws after the exhaust valve has closed, and before the admission valve from the boiler opens again. The «atmospheric line» upon such a diagram is the line that the indicator draws when disconnected from the engine, and in free communication with the atmosphere.

Line of Beauty, in art, an ideal line frequently represented in the form of a very slender elongated letter S.

Linen, a cloth of very extensive use, made of flax, and differing from cloths made of hemp only in fineness. Hemp is in part now used in manufacturing cloths which are called linen. In common linen the warp and woof cross each other at right angles; if figures are woven in it is called damask (q.v.). The species of goods which come under the denomination of linen are table-cloths, plain and damasked, cambric, lawn, shirting, sheeting, towels, etc. Linen cloth, or cloth woven of combinations of cotton or other textile fabrics with linen, is printed in the same manner as calico. Fancy cloths are also made by weaving with yarns dyed of various colors, and sometimes with printed yarns. Linen is extensively manufactured in England, Scotland, and Ireland. It is also a staple in various parts of Europe.

The beauty of linen consists in the evenness of the thread, its fineness and density. The last of these qualities is sometimes produced by subjecting it to rolling, hence linen with a round thread is preferred to that with a flat thread. The warp or woof is not unfrequently made of cotton yarn, which renders such stuff, called union cloth, less durable. In a historical view linen is interesting from its use by several nations in their religious ceremonies. The Egyptian and Jewish priests wore it at all their religious ceremonies, hence the former are styled by Ovid and Juvenal, «linen-wearing.» Linen was an article of export from Egypt in the time of Herodotus. From Egypt the use and manufacture of linen probably passed to the Greeks and Romans, but the use of linen did not become common at Rome till late in the history of the republic. The Roman priests wore linen garments at that time. Among the Greeks a linen tunic was a regular part of the male costume as early as the Homer period. Linen was also used as a material for writing, as shown by the Roman *libri lintei,* «linen books.» The mummy bandages, covered with hieroglyphics, are also proofs of this use of linen. In the Middle Ages linen and woolen cloth formed the chief materials for dress, and fine linen was held in very high estimation. Germany and Brabant then carried linen manufactures to the greatest perfection.

The weaving of linen has been practised in Great Britain for a very long period, beginning with the Anglo-Saxon times, but though the manufacture has been much extended since the introduction of machinery, its expansion is limited by the greater cheapness and convenience in many respects of cotton. The English linen industry owed much to Flemish weavers, who settled in England at various times from the 11th or 12th century onward. The chief seat of the English linen manufacture is Leeds and its neighborhood, where spinning is carried on on a very extensive scale. A single room in one of the factories at Leeds is said to cover two acres. Ireland and Scotland, however, are much larger manufacturers of linen than England.

Linen was woven in Ireland as early as the 11th century. The manufacture was improved by the refugees who left France on the revocation of the Edict of Nantes, and it was patronized by the Duke of Ormonde. The manufacture never really flourished till it was carried on in mills, and by the aid of machinery. The value of linen goods now exported from Ireland to Great Britain is estimated at about $50,000,000 annually.

Dundee is the seat of the Scotch linen manufacture, and its progress there has been extraordinary. The manufacture appears to have been introduced into Dundee some time about the beginning of the 18th century. In 1745 only 74 tons of flax were imported without any hemp, the shipments of linen cloth during the same year being estimated at about 1,000,000 yards. In 1791 the imports of flax amounted to 2,444 tons, and those of hemp to 299 tons; the exports that year being 7,842,000 yards linen, 280,000 yards sail-cloth, and 65,000 yards bagging. From this period the trade began to extend itself gradually, though not rapidly.

The introduction of machinery in the linen manufacture is of recent origin. It followed the adaptation of machinery to the manufacture of cotton, but as there were some special difficulties to be overcome, an interval took place between the invention of the various cotton machines and their adaptation to the linen manufacture. The machinery used both in spinning and weaving linen is in general, however, the same as that used for cotton. See TEXTILE INDUSTRY, AMERICAN.

Lines, Edward Stevens, American Protestant Episcopal bishop: b. Naugatuck, Conn., 23 Nov. 1845. He was graduated from Yale in 1872 and after two years spent in the Berkeley Theological School, at Middletown, Conn., was ordained in 1874. He was rector of Christ Church, West Haven, Conn., 1874–9 and of St. Paul's Church, New Haven, 1879–1903. In November 1903, he was consecrated bishop of the diocese of Newark, which comprises the northern half of New Jersey.

Lines of Force. See FORCE.

Ling, a sea-fish (*Lota molva*), resembling a pike in shape and 3 to 4 feet long, but a member of the cod family (*Gadidæ*). It abounds around the British coasts; its fishery approaches in importance and resembles in methods that for cod. Great quantities are preserved by drying, salting, etc.; and an excellent oil is extracted from the liver.

The name is also given to the eel-pout or burbot, another species (*L. vulgaris*) so-called not only in Europe but in northern New York. See Burbot.

Linga, lĭng'gạ, an emblem commonly used in the sectarian worship of the Hindus. It represents the male or generative power of nature. Originally of an ideal and mythical nature, it has degenerated into practices of the grossest description; thus taking the same course as the similar worship of the Chaldæans, Greeks, and other nations. The manner in which the linga is represented is generally inoffensive — a pillar of stone or other cylindrical objects being held as appropriate symbols of the generative power of Siva. Its counterpart is «Yoni,» or the symbol of female nature productive. See also SIVA.

Lingard, lĭng'gärd, **John,** English historian: b. Winchester 5 Feb. 1771; d. Hornby, Lancashire, 17 July 1851. He was educated for the Roman Catholic priesthood at Douay, was ordained in 1795 and was first stationed at Newcastle-upon-Tyne. Here he published in 1805 ‹Catholic Loyalty Vindicated.› His next work of importance was ‹Antiquities of the Anglo-Saxon Church.› His greatest work, the ‹History of England from the Invasion of the Romans to the Year 1688,› printed in 8 vols. (1819–30), reached a fifth edition in 1850, when it appeared in 10 vols. It has since been regarded as a valuable work of reference by historians of all parties. It possesses for Protestant historians the valuable quality of giving the views on controverted points of an able and well-informed Catholic writer. The 1850 edition of the history was elaborately revised by the author. Apart from the sympathies of the writer, the work is universally regarded as one of high authority. He refused a cardinal's hat offered him by the pope, but accepted a pension of £300 a year from the queen.

Lingayén, lĭn-gā-yān', Philippines, a pueblo and the capital of the province of Pangasinán, Luzon, situated on an island of the delta of the Agno River, formed by one of the outlets of the river and the Gulf of Lingayén. It has a fine parish church and the buildings generally are well constructed, many being of stone. The Manila and Dagupan railroad has a station within eight miles at Dagupan, and Lingayén is the converging point of several important highways and has frequent communication by water with Manila. It has therefore an important trade. Pop. 18,900.

Lingayén, Gulf of, an arm of the China Sea indenting the western coast of the island of Luzon, Philippines, north of Manila Bay. The width of the entrance from San Fernando Point to Santiago Island is 20 miles. The east coast is mountainous; the west coast is generally level and less elevated and is fringed by low wooded islands, the channels between which are navigable for native coasters. Typhoons are prevalent in September and October.

Lin'gula. See BRACHIOPODS.

Liniers y Bremont, Santiago Antonio Maria de, sän-tē-ä'gō än-tō-nē-ō mä-rē'ä dā lĕn-ē-ärs' ē brā-mōnt', Spanish naval officer: b. Niort (Deux-Sèvres), France, 6 Feb. 1756; d. near Buenos Ayres, Argentine Republic, 26 Aug. 1810. After the French Revolution he entered the Spanish naval service, in which he attained captain's rank. He defended Montevideo against the British in 1806, and in 1807 forced them to relinquish Buenos Ayres, which they had occupied. The ruling viceroy was then deposed by popular demand, and Liniers selected for the post (16 May 1808). The British soon attacked Buenos Ayres, and, 1 July gained a battle under its defenses; but Liniers successfully managed the resistance and the enemy, after a retreat and large losses, withdrew from the country. He was succeeded in 1809 by Cisneros, whose rule was followed by the revolution of 10 May 1810. Liniers thereupon marched from Cordobá to Buenos Ayres for the purpose of quelling the revolt; but was captured, and shot.

Linley, lĭn'lĭ, **Thomas,** English composer: b. Wells 1732; d. London 19 Nov. 1795. He was a pupil of Chilcot at Bath and of Paradies at Naples, became one of the best English vocal instructors, and for several years directed the concerts at the Bath assembly-rooms. In 1774 he became joint director of the Drury Lane oratorios, in 1776 purchased Garrick's share in Drury Lane, and in 1776–91 directed the music there. His music contributed greatly to the success of Sheridan's «Duenna,» which was performed 75 times during the season. He also composed the much admired accompaniments to the «Beggar's Opera,» various other music for dramatic works, and glees, canzonets, and songs. He obtained high place among English composers through his simplicity and excellent taste.

Linlithgow, lĭn-lĭth'gō, Scotland, the county town of Linlithgowshire, 16 miles west of Edinburgh. It is an ancient royal burgh, with a fine 12th century Gothic church, and other historical edifices, chief of which is Linlithgow Palace (mostly rebuilt between 1425 and 1628), the birthplace of James V. and Mary Stuart. Pop. (1901) 4,279.

Linn, James Weber, American author and educator; b. Winnebago, Ill., 11 May 1876. He was graduated from the University of Chicago in 1897 and since 1899 has been instructor there. He has published 'The Second Generation,' a novel (1902); 'The Chameleon' (1903).

Linn, William Alexander, American journalist: b. Sussex, N. J., 4 Sept. 1843. He was graduated at Phillips Academy, Andover, Mass., in 1864, at Yale in 1868, and in 1883 was admitted to the New York bar. From 1868 to 1891 he was engaged in newspaper work, during part of that time being on the staff of the New York *Tribune,* and was managing editor of the *Evening Post,* 1891–1900, resigning to devote himself to literary work. He was a member of the New Jersey commission of 1899, by which, together with the Interstate Commission, of which he is a member, the passage and enforcement of laws for the prevention of the destruction of the Palisades were secured. He is a contributor to agricultural and horticultural papers, and has also written 'The Story of the Mormons' (1902); 'Rob and His Gun' (1902); and 'Horace Greeley' (1903).

Linnæus, lĭ-nē'ŭs, **Carolus,** the Latinized form of the name of Carl von Linne, Swedish botanist: b. Rashult, Småland, 12 May 1707; d. Upsala 10 Jan. 1778. He showed an early interest in botany; entered the University of Lund, where his botanical tastes were encouraged by Kilian Stobæus, physician to the king, from whose library he was supplied with necessary books. In 1728 he went to Upsala, where he undertook the supervision of the botanic garden. Here he made the acquaintance of the botanist, Rudbeck, whose assistant he became, and assisted Olof Celsius in the preparation of the latter's 'Hierobotanicon.' Aided by the Academy of Sciences at Upsala, Linne made a journey about 4,600 miles through Lapland, the result of which was shown in his 'Flora Lapponica,' published 1737. In this year he went to the University of Harderwyk in Holland and took an M. D. degree, and later visited Leyden, where he published his first sketch of his 'Systema Naturæ' and 'Fundamenta Botanica.' In 1736 he visited England, and in September 1738, settled in Stockholm as a physician. He slowly acquired a practice, was made naval physician of Stockholm, and obtained some minor appointments. He became professor of medicine at Upsala in 1740, and of botany in 1741. He was ennobled in 1737. During his professorship of botany he drew students from all over the civilized world, increasing the number attendant on the university from 500 to 1,500. The importance of Linnæus' work can scarcely be overrated. It has been said that "he found biology a chaos; he left it a cosmos." He it was who established the systematic botany and zoology of modern times. He first announced the principles for the definition of genera and species, and established the binominal nomenclature of both. He was a careful observer, a methodical worker, and a clear and succinct writer. As a teacher he was of great influence in revolutionizing the methods of botanical study. He published more than 180 works, among which the most important are: 'Systema Naturæ' (1735); 'Fundamenta Botanica' (1736); 'Genera Plantarum' (1737); 'Flora Lapponica' (1737); 'Classes Plantarum' (1738); 'Philosophia Botanica' (1751); and, chief of all, 'Species Plantarum' (1753).

Linnell, lĭn'ĕl, **John,** English painter: b. London 16 June 1792; d. Redhill, Surrey, 20 Jan. 1882. He began his artistic career as a pupil of West and Varley and was for some time a successful teacher of drawing, numbering among his pupils Mary Wollstonecraft Shelley. He had painted from his 15th year confining himself exclusively to landscape. Between 1824 and 1838 he produced a number of excellent pictures in this class. Originally an imitator of Gainsborough, he soon developed a brilliantly original style. He was particularly successful in portraying the insular sky scenery of England with its varied cloud forms, and changing play of sunlight, and his works combine delightful freshness with supreme skill in handling. In the South Kensington Museum is one of his pictures, «Girls Gathering Flowers,» and in the National Gallery are his «Wood Cutter,» and «Windmill.» Consult: Story, 'Life of John Linnell' (1892).

Lin'net, a very common and attractive song-bird, one of the smaller migratory finches, of southern Europe and adjacent countries of Africa and Asia. In autumn and winter the plumage is brown-streaked and dull, but in the spring molt, on the approach of the breeding season, the breast and head of the mature male become bright crimson. This gay dress is assumed and put off gradually, and bird-catchers speak of brown, gray, red or rose linnets as if they were separate species, but there is only one — *Linota cannabina.* The name refers to the fondness of the bird for hemp, flax-seed, and the like, formerly called the «lint» crops, whence comes the Scotch names «lintie,» «lintwhite,» etc., and the English «linnet.» The habits of these birds in the fields are much the same as those of their relatives the American goldfinches, or of the redpolls, called «linnets» in Canada. These are among the most prized of cage-birds for the sake of their song, and are taken in great numbers in traps as well as extensively bred. They will interbreed with the canary and an interesting and valuable hybrid has thus been produced. The song is loud, flute-like and exceedingly agreeable; it consists of several connected strains, and is esteemed by connoisseurs in proportion to the frequency with which certain clear sonorous notes, or «crows,» recur. It sings throughout the year, except when molting, and may be taught various airs and melodies not its own — even to imitate well the complicated song of the nightingale. Such education is rarely given it, however, except in Germany. The care and feeding of a linnet should be the same as those given a canary. See CANARY; CAGE-BIRDS.

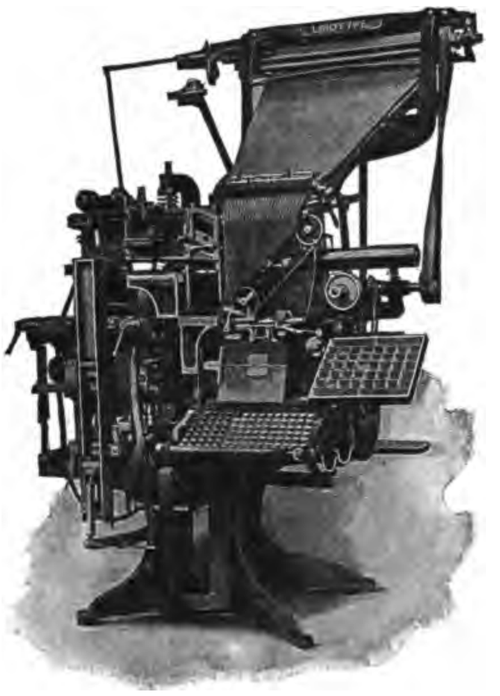
Linnet-hole, in glass making, a table connecting the glass-melting furnace with the arch.

Lino'leic Acid, one of the constituents of linseed oil, obtained by saponifying the oil with soda, separating the soap, and decomposing it with chloride of calcium. After washing, the soap is treated with ether, which dissolves the linoleate of calcium. This salt is next decomposed with hydrochloric acid, and the linoleic acid taken up by ether. After distilling off the ether the oily acid remains, which is converted into a barium compound which is purified by crystallization, and from this the acid is finally got by addition of sulphuric acid. It is a pale-yellow oil, insoluble in water, but readily soluble in ether. It is lighter than water, has a slight acid reaction and harsh taste.

Lino'leum, a kind of floor-cloth introduced in England in 1860. It consists of a mixture of oxidized linseed oil and ground cork spread in a uniform layer upon canvas, the surface of which may be printed in patterns of different colors as in ordinary floor-cloth. The oxidizing of the linseed oil, by which process it becomes a caoutchouc-like substance possessing a certain amount of elasticity, is effected by exposing it in thin films to the influence of air. Certain proportions of kaurigum, rosin, and pigments, according to the ground color desired, are added to the oxidized oil, which is then intimately mixed with the ground cork, and firmly squeezed on and rendered adherent to the surface of a rough canvas backing, which is afterward coated or waterproofed with oil paint. An embossed linoleum, washable, waterproof and warm, invented by Frederick Walton as a substitute for wall paper, is named after him «Lincrusta Walton.»

Linosyris, in botany; Goldylocks; a genus of *Composites,* sub-order *Solidagineæ.* The achenes are compressed and silky, the pappus in a double row pilose, the involucre of one row of scales, surrounded by several long ones, or imbricated; the florets all perfect, deeply five-cleft, yellow. Ten species known from Europe and the West of Asia.

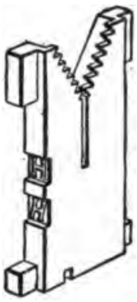
Linotype, The, a machine designed to do the work of both type setting and type casting, by substituting for lines of individual type, metal bars or slugs with raised letters on one edge. These bars, when arranged in page form, have the same appearance as pages of separate type and may be used either to print from direct or to produce stereotype or electrotype plates in the usual manner. The machine will produce type faces of any kind desired, from 5 to 12 point; requires but one operator, and gives a product equal to five or six hand compositors, furnished with ordinary type.



The linotype was invented in 1885 by Ottmar Mergenthaler, a German by birth, then living in Baltimore, and first put into practical use by the New York *Tribune* in 1886. Since then it has come into general use by newspapers and printing offices throughout the world. In the United States about 10,000 of them are employed on all classes of composition, including the finest books and magazines.

The machine contains as fundamental elements several hundred brass matrices. Each matrix consists of a flat plate having in one edge a female character or matrix proper, and in the upper end a series of teeth which are used for distributing the matrices to their proper places in the magazine of the machine. Matrices are also made having two characters, as for instance, a Roman and Italic letter, either of which may be used at will. There are in the machine a number of matrices for each letter, and also matrices representing special characters and spaces.

The general organization of the machine is shown in outline in Fig. 1. A represents an inclined fixed magazine, containing channels in which the assorted matrices are stored and through which they slide, entering at the upper and escaping at the lower end, one at a time. Each channel in the magazine has at the lower end an escapement B, connected by a rod C with a finger key D, representing the letter or character of the matrices in the corresponding channel. There is a key for each character, and also keys for quads and for the wedge spacers.



The operation of the various keys results in the selection of the matrices and spacers and their collection in assembler G, until it contains all the characters to be represented in one line of print. After the line is thus composed, it is transferred mechanically, through the path indicated by dotted lines in Fig. 1, to a position in front of a mold or slot extending through the wheel K, from its front to its rear face. This mold is of the size and shape of the slug or linotype required, and it determines both the measure and the body of the line. While the line is in place in front of the mold, the wedge spacers are pushed up through the line, which is instantly and exactly justified thereby.

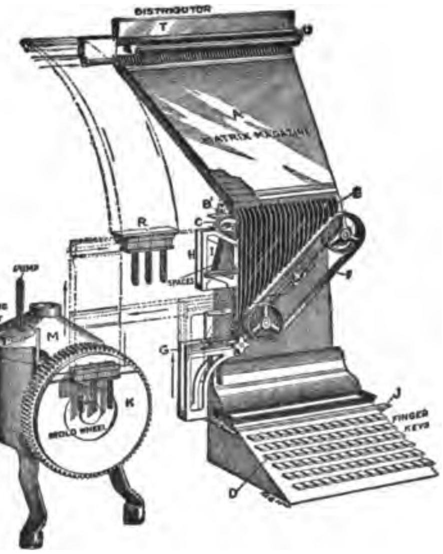


Fig. 1.

Behind the mold, there is a melting pot M, heated by a flame from a gas or oil burner. After the matrix line is in place against the front of the mold, as shown in Fig. 1, a pump forces the molten metal through the pot mouth into the mold, against and into the characters in the matrix line. The metal instantly solidifies, forming a slug having on its edge raised characters formed by the matrices. The slug is then automatically removed from the mold, being trimmed to the proper length and thickness by knives. The line is then lifted from the mold and shifted laterally, until the teeth in the upper end of the matrices engage the horizontal ribs on a bar which rises, as shown by dotted line at R, lifting the matrices to the distributer at the top of the machine. The matrices are then transferred to a second bar, still suspended by their teeth, and by screws made to travel along the bar and across the entrance to the magazine. By means of nick combinations of the bar ribs and matrix teeth each character is released over and slides into the proper channel.

It is to be particularly noted that the matrices pursue a circulatory course through the machine, starting singly from the bottom of the magazine, passing thence to the line being composed, thence to the mold, and finally back singly to the top of the magazine. This circulation permits the operations of composing one line, casting from a second, and distributing a third to be carried on concurrently, and enables the machine to run at a speed exceeding that at which any operator can finger the keys. See Composing Machines.

William T. Woodward.

Lin'sang, one of the beautiful spotted civets of the Oriental genus *Prionodon*, of which various species are to be found from northern India to Borneo. The West African linsang (*Poiana poensis*) is a rare species from the Fernando Po district, which is closely allied to the Malayan ones. They have the general characteristics and habits of the civets (q.v.) but are especially expert in tree-climbing and feed mainly upon birds.

Lin'seed, or Linseed Meal. See Flaxseed.

Linseed Oil Industry, The. In the commercial world there are known at the present time a number of vegetable oils, which in the raw state and without the aid of chemicals are capable of absorbing the oxygen of the air to a greater or less degree, and commonly called «drying oils.» By far the most valuable to commerce, both as to usage and results obtained, is the linseed oil expressed from the seed of the plant «Linum usitatissimum,» the common term generally applied to this seed being «flax seed,» and probably due to the fact that early in our history the plant was commonly referred to as the «flax plant,» the object of its cultivation at that time having been principally for the flax fibre. Although the great commercial importance of linseed oil, due to the large increase of manufactured products in which it is used, has been of but comparatively recent years in this country, the seed or plant bears the hall mark of great antiquity. It is positively known that certain drying oils had been discovered prior to the Christian Era and probably in times of remote antiquity, and, though uncertain, it would seem reasonable to assume that linseed was among them. The first mention of linseed is made by Dioscorides, a mediæval writer on medicine, living in the time of Augustus; descriptions, however, of certain decoctions of linseed alone are given, and the resultant oil is not distinctly described. In fact, this applies to most writers of that and later periods. They were students of natural history and medicine, and undoubtedly gave little thought to the commercial value of the oil, especially as there was at that time very little use for it. For example, Hippocrates mentions only the use of bruised linseed as a medicine of astringent properties. Pliny speaks simply of the juice of the linseed. For centuries it appears that the oil's greatest characteristic, its wonderful drying properties, was given little attention. In the second century Galen speaks only of it as being «in its nature, drying,» and in the fifth, Aëtius, a medical writer, though distinctly describing it in connection with art, passes completely over this important point. For many years following this century, however, painting and medicine remained almost solely in the hands of the monks. Having plenty of leisure time, and guided perhaps by the expressions of former Greek writers, these monks experimented to some extent on the siccative qualities of linseed, which resulted in its limited use with other oils, principally as a preservative varnish for gilt and paintings in fresco and tempera. It was not, however, until the 12th century, when oil painting was discovered, that we may say a true appreciation of the essentially exclusive properties of linseed was felt, and from that day to this it is the only oil that has successfully satisfied all the requirements of oil painting; and, remarkable though it may seem, genius has for nearly seven hundred years sought for a substitute, either elementary or in combination, which would entirely fulfill all conditions of commerce, but without success. Whether a substitute will ever be found is extremely doubtful, and it is a well-known fact that there is no adulterant for linseed oil, inasmuch as the smallest admixture of any other oil is highly injurious to its peculiar qualities.

Manufacturing.—In its early history the uses for linseed oil were few and the quantity consumed insignificant, the growth of the industry being appreciable only within the past century. In earlier years the small amount required, principally by the artists, was produced by little, if any, apparatus, and often in the studio. Later, the oil began to find more enlarged fields of usefulness, and the crudest of mechanical apparatus was devised for its manufacture. With such appliances, however, oil could be produced only at an excessive cost, and its use on a broad commercial basis was not feasible. Indeed, up to within comparatively recent years the invention and improvement of linseed oil machinery has been slow, and in fact to the United States may be attributed the greater part of the advance made in this industry in the past 100 years. The early settlers of this country, coming, as most of them did, from the flax growing countries of Europe, brought with them the primitive press which had been used by their fathers and forefathers, and upon which no improvements worth mentioning had been made. In this industry, as in many others, the United States has taken the lead, and the machinery now in use is better adapted to the purposes than in the older countries of Europe, where to-day, in fact, one may see in places the ancient oil press used by our grandfathers. The earliest method recorded for the production of linseed oil is a receipt by Theophilus, a monk writing in the 12th century, and which becomes particularly interesting when we find that the treatment of the seed or method was almost identically the same as it is to-day. «Take linseed and dry it in a pan without water, on the fire; put it in a mortar and pound to a fine powder; then replace it in the pan, and pouring a little water on it, make it quite hot. Afterward, wrap it in a piece of new linen, place it in a press used for extracting the oil of olives, of walnuts, or of the poppy, and express it in the same manner.» It will be seen from the above that the seed was treated separately four times as follows: Dried, crushed, cooked and pressed. With the exception of the drying, which is not necessary, the plan of procedure to-day is the same. During the intervening years, however, many different methods have been used as well as different kinds of machinery.

In the making of linseed oil there are two very essential steps which must be carefully watched; the first is the crushing or grinding of the seed; the second, is the cooking or «tempering» of the ground seed. In the proper manipulation of these two processes rests a crusher's ability to make a good yield of oil. Years ago the present day yield of oil would have been deemed impossible. Although the contrivances for grinding the seed were in early years as primitive as the presses with which they were used, and although many improvements have since been made, yet the grinding was fairly well done, and it seems that the light yields of oil in former years were not due so much to the grinding of the seed as to the lack of, or improper, tempering. Heat and moisture are of the greatest importance in producing the best yields; we find, in fact, that many times the ground seed or meal was pressed entirely without cooking. Oil made in this manner was called «cold pressed» oil. That such oil, however, was made through any lack of proper cooking devices or ignorance, is extremely doubtful. In years gone by little was known about the chemistry of linseed oil, but it was noticed that in the cold process the oil expressed was beautifully light in color and heavy in body; furthermore, upon boiling to a high temperature the oil did not darken but became lighter, and after mixing with the varnishes was perfectly clear and without sediment. On the contrary, oil made from the tempered meal was thinner and darker in color; on boiling at high temperatures it darkened still more, and threw down a quantity of white and greasy precipitate. Such oil of course was looked upon with suspicion; it was considered by many unfit for most uses and was never used in good varnishes. Owing to the light yield of oil in the cold process, however, the price was excessive, and for this reason much attention was devoted to the refining of the oil made by the hot process, so that it might be used in high grade goods and for particular work. For many years, however, careful men remained strongly prejudiced against hot tempering; in later years this prejudice gradually disappeared, but it was only when practical and successful processes had been invented, whereby the objectional features could be removed from the hot pressed oil. During this period, however, many thousands of gallons of the hot pressed oil were manufactured, to be used where quality was a small consideration and price of the greatest importance; in fact, an insufficient quantity of the cold pressed oil was made to supply the demand, and Calcutta oil, which has the same properties as cold pressed oil, was imported in large quantities to make up this deficiency. In these days of sharp and bitter competition, a crusher depends almost entirely upon his yield to make his profit; consequently, all oil is made from the tempered meal, and the best equipped mills are supplied with chemical or mechanical apparatus which converts the hot pressed oil into refined oils almost equal in quality to the old time cold pressed oil. Small amounts of Calcutta oil are still imported, but the price is much higher than the domestic refined, which gives perfect satisfaction and which in the near future will undoubtedly be used to the exclusion of all others.

Probably the first attempt to manufacture linseed oil in quantities considerably in excess of that produced in the earliest times and by means of the crudest apparatus, was by the ancient screw and lever press. This was simply a modification of the old cider press and consisted of a barrel, sometimes of cast iron, perforated to give a free outlet to the oil, and fitted with a plunger which, when actuated by the screw, descended into the open barrel upon the mass of meal contained therein, and by means of slow pressure thus exerted expressed a reasonable amount of oil. This press was worked by a hand lever placed through an eye at the head of the screw, like a bar in a capstan. Little oil was secured, however, in comparison with presses actuated by machinery, where the pressure is many times greater than can possibly be secured by hand. On this account considerable oil remained in the dry residue known as oil cake; these weighed about 25 pounds each and were about 18 inches in diameter by 8 inches thick, resembling a cheese in shape and thus giving to it the name of «Cheese Box» press. The capacity of this press was small indeed, amounting to less than one barrel of oil a day. The date cannot be definitely stated when the screw and lever press was first used, although linseed oil was undoubtedly first made by it in this country. It was retained in use as late as 1848. Many years prior to that date, however, the improved Dutch mill or wedge press had come into vogue. These mills were imported early in our history from Holland, where in some places they may be still seen in actual use, and were at that time considered a great improvement over the old screw and lever presses. The wedge press as it was introduced to America consisted of a very heavy rectangular frame work of oak or iron, placed horizontally on its base. The ground seed was shoveled by hand into woolen bags and these were placed in the press so as to hang vertically between hinged partitions, consisting of wooden plates. The capacity of the press was about nine or ten of these bags, and giving a daily pressing of not over 15 to 20 bushels. The cake manufactured in this press weighed from 8 to 10 pounds each, after the raw edges had been trimmed. The pressure requisite for the expression of the oil was obtained by driving wooden wedges between the plates by means of sledges driven by wind or water power.

It is impossible to state at just what time the wedge press was discarded for the horizontal hydraulic press, the next step in the advancement of the industry and undoubtedly the most important. Linseed oil, however, was made by this process as late as 1853. In 1796 the first hydraulic press was built. This brought about great changes in many industries as well as in the manufacture of linseed oil. The first presses were indeed very small affairs in comparison with those now in use, but their invention was an epoch maker in the linseed oil industry. The earliest type used was similar to the old screw and lever press in shape, and of the cheese box variety. It is doubtful, however, in the absence of authentic records, that this variety was used in this country for linseed. Probably the first hydraulic presses used in the United States for linseed oil were of the horizontal type, having been installed in a New York mill shortly after the war of 1812. In these presses the plates were of iron instead of wood, and movable; the ground seed was shoveled into the woolen bags as before, but flattened by the hand of the workman and placed in mats of horsehair, which were folded in book form. After placing in the press vertically, one at a time, the iron plates were moved up against each bag, when the ram of the hydraulic cylinder moving horizontally compressed the eight or nine cakes contained in the press, the oil running into a trough or pan beneath. Very simple hydraulic pumps were used at that time to generate the pressure; the yield of oil, however, was very much increased by this method, it being practically impossible to secure a sufficiently high and steady pressure by the old wedge and screw process. The horizontal press, however, though an improvement over these methods, had its disadvantages. In 1851 the first patents for vertical hydraulic presses for linseed oil were granted. The capacity was not increased over the horizontal type at this time, the press holding only 6 to 10 cakes. The clumsy and unwieldy manner of packing the meal in the bags and filling the presses, however, was done away with. What is known as «boxes» were used, the ground seed being molded into soft cakes, packed in wrappers and placed in the press, one above the other, the boxes acting as shelves. A large saving was made here in labor and time, necessarily resulting in considerable increase of capacity and consequent reduction in the cost. With the improvements in the manner of pressing the seed came improvements in grinding or crushing. For many years undoubtedly the mortar and pestle of Theophilus was used on some basis; this, however, was very crude, and took an unnecessary amount of labor. Linseed was crushed first in this country by rolling through a mill worked by hand; the rollers in this mill consisted of one large and one small, the seed being passed through once or twice, according to the views of the crusher. This mill in the earliest time was probably used with the screw and lever press. The earliest method for reducing the linseed to meal by machinery was that used in connection with the Dutch mill or wedge press, and was called the «Tamper» mill. This was a mortar and pestle on a large scale. The mortars were of heavy cast iron, the bottom flat on the inside and holding a small amount of flax seed; the pestle was an iron-shod log, standing vertically in a frame, the foot resting on the bottom of the mortar; these logs, weighing from 150 to 200 pounds each, were raised, by means of cams on a horizontal log, by water or wind power, and falling of their own weight exerted a crushing or grinding force upon the seed. The tampers, as they were called, numbered one or more in the set, according to the size of the mill. As in the case of the screw and wedge press, however, this method was found entirely inadequate to the needs of the oil mill. The capacity of a mill was necessarily cut down very much by such a slow process, and rolls run by machinery were resorted to; these were of different design from the old hand rolls, and were designated in the trade as «cracker» rolls, for the reason that they cracked or opened the seeds. These rolls were arranged in pairs only and varied in size from 12 to 18 inches in diameter and 7 to 18 long, according to the views of the manufacturer. After being bruised in these rolls, the seed was placed in an edge-runner or chaser, also known as a «Muller» stone. This consisted of a circular trench of iron, several feet in diameter, placed horizontally on a firm foundation. Running around this, like a wagon wheel in a rut, were two ponderous iron shod wheels, 5 to 6 feet in diameter with steel tires 10 to 16 inches wide. These were sometimes made of stone and set opposite one another on a shaft and weighed about 7,000 pounds each. Around and around these wheels revolved, chasing one another until the meal was finely crushed and rolled, when water was added until the meal acquired the consistency of putty, or what was termed as «dobby.» It was then mixed or «mulled» for some 10 or 15 minutes and then tempered. These Muller stones proved very satisfactory as to results, but were clumsy and took a great deal of power; furthermore, the expense of two grindings was unnecessary. Nevertheless, no change was made for many years.

The tempering or cooking of the crushed seed having such an important bearing on the yield of oil, has also suffered many changes. In the earliest times many different devices of the crudest workmanship were used, often no more nor less than large cooking utensils; there was also considerable variation in the temperature used, from cold to hot, according to the manufacturer. Often the spontaneous heat of the crushing was considered sufficient. In the tamper of the Dutch mill water was played on the meal in the mortar, when vapors began to arise, in order to keep it from getting too hot and thus spoiling the oil. No further tempering was considered necessary. Later, however, and notably in connection with the Muller stones and wedge press, regular cookers began to be used; these were heavy sheet iron drums or tanks, slowly revolving over a charcoal fire until the proper temperature was attained. With the advent of the hydraulic press, however, improvements were made in cooking devices and stationary heaters began to be used in which the meal was cooked by steam. Up to the year 1856, and as related, the cooked meal was placed in the bags by hand; at this date, however, a device was patented to form the cooked meal into soft cakes or molds preparatory to placing them into the cloth or wrapper which was to take the place of the bags originally used. This was considered a great boon, saving as it did, the laborious process of handling and molding the meal by hand to fit the press; though somewhat clumsy at that time, the «molder» or «former» has been much improved. Where in former years the molder was run by power from the shaft, now hydraulic pressure is utilized, and the «former» is in reality a miniature press, consisting of a square mold or box into which a plunger presses the required amount of meal. Very light pressure is sufficient, and it is so arranged that the cooked meal will not be compressed beyond the point where the oil is separated.

The tempering, crushing and pressing of linseed was carried on, with a few exceptions, substantially as related up to the year 1878, when the most lasting improvement to oil machinery was made, and which introduced practically the system in use at the present time; namely, the «Lawther» process. Greater economy was immediately secured and larger yields of oil. The old Muller stones and cracker rolls gave way to the stack of «four or five high» chilled iron rolls, by means of which the seed was bruised three or four times in one process. Apparatus for controlling and regulating the high pressure was introduced; kettles or cookers were steam jacketed and had larger heating area, and steam was fed into the meal to moisten as well as heat it. The plate press had also been given the preference over the box press, which was clumsy. Although the very best mills to-day have some improvements over the original Lawther process, they make rather toward greater economy than increase of yield. The modus operandi in the largest and most complete mill to-day is as follows: The flax seed is first thoroughly cleaned by separators and dust collectors until the original dirt, amounting to 10 or 20 per cent, has been reduced to less than one per cent, and which is considered as clean as it is practical to make it. This seed is now passed through the rolls, there being about one set of five rolls high to every three presses. The ground seed falling from these rolls is led by screw conveyors into the steam jacketed cookers of large capacity and holding a considerable quantity, where it is tempered. This consists of heating the ground seed to a temperature of from 120° to 180° F., according to the quality of the seed used, and moistened with live steam, all the time being kept in constant motion to prevent burning. When the temper is considered perfect a batch is made. This consists of drawing off the cooked meal on to the formers and molding the cake; these molders are the latest design and are very rapid in action. A piece of cloth somewhat wider than the molded cake is placed so that the tempered meal may be drawn out onto it. This cloth or wrapper, as it is called, is a substitute for the horse hair cloth and woolen bags of former days, but now made of pure camel's hair to stand the high heat and enormous pressure. By a single motion the former is now closed and immediately reopened, when the ends of the cloth protruding are wrapped around the soft cake and it is placed in the press. The batch consists of making 20 of these cakes, which fills one press. The pressure is now turned on by an automatic valve or change cock, which slowly increases the pressure up to about 4,000 pounds to the square inch. This enormous pressure is generated by very powerful hydraulic pumps, connected to what is known as the accumulator system. The accumulators are for two purposes; first, to act similar to a safety valve on a boiler, preventing the pressure from exceeding the limit; secondly, keeping the pressure at a steady level throughout the time the seed is in the press, and preventing the pressure from decreasing one pound. Before the adaptation of the accumulator and change cock, the oil was pumped directly into the press, causing an unequal flow and consequent reduction in the yield of oil. Six presses are generally grouped, one being emptied and refilled every ten minutes, the six thus completing one hour in time and allowing each press in the group to drain every 50 minutes. In some mills seven batches are made instead of six, and the weight of the cake is also increased from 11 and 12 to 14 pounds. This is done in order to increase the capacity of the mill, but generally at a sacrifice in yield of oil. As each batch is removed from the press, the camel's hair cloth wrapper is stripped off, the rough edges of the cake trimmed automatically, and the cake piled up in the cake house, where it is allowed to cure or dry for at least 48 hours. The raw oil, after having been run from the settling troughs at the back of the presses, is carefully filtered and placed in tanks ready for barreling.

The Oil and Its Uses.—Linseed oil as manufactured may be classified under three headings: raw, boiled and refined. Raw linseed oil is the term applied to oil as it comes from the press in its original state. The principal consumer of raw linseed oil is the paint grinder; as it was used as a vehicle for paint hundreds of years ago, so it is used now. Every year millions of gallons are spread on our houses and public buildings in the form of mixed paints, one concern alone using over 1,500,000 gallons yearly. Every 100 pounds of white lead contains at least 7½ gallons. Boiled linseed oil is, as the name denotes, raw oil boiled over a fire, chemicals being added, the object being to increase its drying properties. Many formulæ are used by the different crushers for making boiled oil, the oldest and most reliable, however, containing principally red lead and black oxide of manganese, the addition of these metals to the heated oil stimulating the linoline and increasing its affinity for oxygen. The uses for boiled oil are many and varied, but it is principally used as the drying oil in paints. The refined or varnish oils are many, and there is the greatest rivalry to-day among oil manufacturers as to the qualities of their respective varnish oils. Hundreds of thousands of gallons of these oils are used every year. While the different gums used in the manufacture of varnishes are the basis or foundation, some variety of refined oil is the most important component of the varnish. As stated before, raw linseed oil has certain component parts which must be removed; there are many ways of doing this. Descriptions, however, of these methods will not be attempted, as they pertain more particularly to the chemistry of linseed oil and not to its manufacture. The reliable varnish oils are few and are furnished only by the largest manufacturers. Linseed oil in some form plays a very prominent part in the manufacture of linoleum and oil cloths also. Varnish oils are used in the manufacture of patent leather, for shoes and other purposes, carriage tops, and all kinds of dressed leathers are finished with linseed oil. The oil clothing worn by sailors and fishermen is soaked with it. It appears by the thousands of gallons before our eyes in the printers' ink on newspapers, and smaller quantities are used in the manufacture of oil silks. Strange to say, linseed oil has no value as an edible oil, or as an illuminant or lubricant. In a few instances we find linseed oil used fresh from the press as a cooking oil and even as a substitute for butter, but mostly by foreigners, notably Russians or Poles; it is needless to say, however, that the consumption in this way is most insignificant. As an illuminant it is useless, burning only at high temperatures with much smoke and giving a poor light. As a lubricant it has no value, although sometimes used as an adulterant, but its drying qualities are obviously the reverse of those required of a good lubricating oil. While not very large in comparison with other industries, the consumption of linseed oil in the last few years as compared to former years has increased very rapidly, and at the present time the above industries consume annually an amount computed at nearly 62,000,000 gallons. The price of linseed oil is of course governed by the cost of manufacture and principally by the price of seed and cake. Large fluctuations in the price of a commodity are generally very injurious to the trade in such commodities. While the fluctuations in linseed oil have been very large at times, the growth of the industry has been such that no great apparent injury has been done. Probably the highest price ever obtained for domestic raw oil was $2.03 per gallon in 1867, the price having risen gradually from $1.00 per gallon in 1861. These prices were, of course, war prices, and after 1867 steadily declined, ranging from 60 to 70 cents as high, and 40 to 50 cents as low. It is a remarkable fact that in these days of great production, manipulation has succeeded in placing the price as high as 82 cents in 1901, the highest since 1870. Owing to the somewhat limited and narrow market for domestic linseed, such manipulation is often brought to bear, and it is the earnest desire of every crusher that this may be eliminated to some extent in the future. The lowest price at which linseed oil has ever sold in its history was in 1897, when actual sales were made on the basis of 24 cents per gallon in wooden barrels. This of course was due largely to the financial panic together with large crops at that time and prices rapidly recovered to a normal basis. The greatest fluctuations experienced in earlier years was in 1867, when oil went from $1.00 per gallon to $2.03, and in later years, in 1901, when it went from 50 to 82 cents per gallon. Linseed oil has always been subject to great fluctuations, and it will be seen by averaging that from 1876 the annual fluctuation has been about 14½ cents per gallon, the smallest fluctuation known being in 1883, when there was only 3 cents difference in price at any time during the year.

The Cake and Its Uses.—While really a by-product, the manufacture and sale of the cake is equal in importance to the sale of the oil, and although netting a smaller price per pound, the value has a very great influence on the course of oil prices and the policy of the business as a unit. Practically the only use for cake is as a food for live stock, principally cattle, for fattening and for results in the dairy. The actual protein in cake is about 36 per cent, of which about 85 per cent is digestible and the nutritive value is consequently several times that of hay, while the fat varies from 4 per cent to 8 per cent, according to the crusher. Although used extensively abroad, it is a singular fact that our farmers in the United States have little, if any, appreciation of its value. Our own country should be the largest consumer of this most valuable by-product; actual figures, however, show that only about 20 per cent is retained for home consumption. The first cost is somewhat greater than for other food stuffs, and our farmers as a general rule lack the knowledge of its value, which comes only by experiment and valuable experience. The manurial value alone of linseed oil cake has been estimated at over $16.00 per ton, whereas the first cost is only from $18.00 to $25.00 per ton Our farmers, it is true, are waking up to its value and more is being used in this country every year, but the bulk of our output is marketed in two very small countries, Holland and Belgium. It is impossible to ascertain the exact quantities of linseed cake exported in the early years of the industry, as all oil cake and oil cake meals were classified under one head. It is, however, fairly safe to assume that by far the larger part of the output each year in the proportion of about 38 to 40 pounds of cake per bushel of seed crushed was sent out of the country; this from the fact that only in recent years has our farmer become educated to its use.

While the two little countries of Holland and Belgium take at the present time about 67 per cent of the cake consumed in all the other countries of Europe, this demand has been of but comparatively recent years. The United Kingdom in years gone by was considered the only market, and Holland and Belgium used only small quantities. For instance, in 1895 only 20,000 tons were shipped to Belgium and 9,000 tons to Holland, whereas in 1896, 115,000 tons were consumed in the United Kingdom. The United Kingdom, however, has reduced her demand ever since that time, while Holland and Belgium have taken rapid steps. From 20,000 tons in 1895, Belgium has increased to 100,000 tons in 1902, and Holland from 9,000 tons to 86,000 tons, while the United Kingdom dropped to about 50,000 tons. As stated, the exportation of cake has grown with the industry and the proportion of export remains practically the same, with the exception that each year a little more is retained for home consumption. The total exports in 1895 were about 120,000 tons, and in 1902 about 290,000 tons. A glance at the figures will show that of the total 290,000 tons the three countries above mentioned consumed 242,000 tons, the balance being divided largely between France and Germany with 18,000 tons each, Canada and West Indies 5,000 each, and Norway, Sweden and Denmark insignificant amounts. It is quite remarkable that so much of our cake finds its way to foreign markets, as the competition is severe, Russia, Germany and England together crushing many millions of bushels of seed annually. In England at least, however, the explanation is simple; more attention is paid to the richness in oil of the cake than in America. The oil is the most valuable product; consequently, with characteristic aggressiveness the Americans proceed to express all of it, or nearly all, leaving only about 6 per cent to 8 per cent in the cake. The result is a much harder cake with considerably less oil in than in that made by our English cousins. This accounts in a great measure for the decrease in the United Kingdom consumption of our cake, and also owing to larger importation of the cheaper cottonseed meal which contains a greater percentage of oil. For some reason, however, the dry, hard American cake seems to be just the correct thing for growing, fattening and feeding cattle for the dairy. The quiet Dutchman prefers our cake above all others, and one need only to look at the figures to prove this statement. It is a very peculiar thing that the use of oil cake is not as general as it seems it should be. Like the American farmer, the Dane for instance will hardly touch it. He claims it spoils the flavor of the milk when fed for this purpose, and although good for fattening is too high priced as compared to cottonseed meal. How it is that Denmark holds the opposite opinion from Holland and Belgium is difficult to explain; it would seem, however, that the immense quantity used by the above mentioned countries, and the world-wide reputation of their dairy products, should conclusively settle the question, and it is altogether probable that on the basis of digestive economy, linseed oil cake is the best food of its kind on the market to-day.

Growth of the Industry.—As stated before, the early settlers brought with them the knowledge of making linseed oil. As the uses then were but limited, very little attention was given to the oil; the flax plant was grown for the flax and not for the seed and oil. In 1719 the spinning wheel was first introduced in New Hampshire by the Protestant Irish who settled there, and flax was grown more abundantly. The seed was for the most part exported, a few thousand bushels only being necessary to fill the home oil wants. The first impetus to the growth of flax for linen fabrics and consequent increase in seed and oil was given in 1722, when bounties for its growth were granted. The increase was immediate, and the plan worked so well that the bounties were continued, and in fact increased, until in 1751 we find it reported that sixty wagon loads of seed were exported at Baltimore. In 1752 a further increase was noted, 10,000 hogsheads or 70,000 bushels of seed being exported from Philadelphia. Twenty years later, 110,000 bushels were sold to the foreigner, and in 1791 292,000 bushels, or upwards of one half of the total crop of the United States in 1860, which was 567,000 bushels. Some idea of the rapid growth after the Revolution will be gained from the fact that in 1791 only 450 gallons were exported, while in 1795 nearly 50,000 gallons were sent abroad, an amount which was not again equaled until sixty years later. In 1792 the invention of the cotton gin placed a severe check on the growth of flax for the fibre, cheapening as it did cotton and cotton fabric. Undoubtedly at this time closer attention was paid to the flax seed for its oil bearing seed; the business was a profitable one, as had been shown by the small export business done. From 1795 the export steadily decreased, showing ever increasing home consumption, and in fact considerable quantities were now being imported. From about 80,000 gallons in 1825, they increased to 3,200,000 gallons in 1867. Short crops and high prices during the war of 1861–5 undoubtedly affected the importation of oil to some extent, but the indication is that there was a heavy demand for the oil which had to be filled. As the case in many other industries, the protective tariffs had a great effect on the production of linseed oil. In 1861 a duty of 16 cents per bushel was placed on flax seed, and 23 cents per gallon on linseed oil. Owing to the fact that very short crops of seed had been grown during the War of the Rebellion, and to the fact that business started up with a boom soon after, large quantities of oil were imported regardless of the duty,—1,150,000 gallons in 1866 and 3,200,000 gallons in 1867. Immediately after this, however, the imports dropped to an insignificant quantity, and have continued so to this day, a certain quantity of Calcutta oil only being imported each year at high prices, for special uses, it being a well known fact that the finest oil in the world is made from East Indian seed. It should also be noted that from 1861 to 1892 practically no seed was exported; it is also interesting to note that though in 1871 a duty of 20 cents per bushel, and in 1897 of 25 cents per bushel was levied, this country continued to import seed in respectable quantities, having reached as high as 4,166,000 bushels in 1895. The conclusion is obvious. The tariff on oil effectively eliminated the foreign competition; the crops of seed grown could not supply the demand; the price of seed goes up and the farmer is encouraged to plant it, while the duty on the seed for import holds that quantity down to an amount necessary to fill our shortages only. By glancing at our statistics, we are surprised to note that although a high duty has been levied on incoming flax, the growth of the industry has been such that until very recent years we have been obliged to call on the foreigner for some of our supplies. In 1839 the first cargo of flax was imported, and from 1854 to 1891 we have been obliged to call for from one to three million bushels annually, with the exception of 1882 and 1883. In 1895 we needed 4,160,000 bushels to fill our consumptive needs. It is useless to make any estimate, which would approach with any degree of accuracy, the amount of flax seed grown in this country from year to year; this is due to the fact that the figures on record are sometimes estimated in one way and sometimes in another. It will be sufficient to say, however, that from 1880, when the crop grown in this country aggregated some 7,000,000 bushels, we have increased to at least 30,000,000 bushels in 1903. In 1902 the crop grown was estimated at about 25,000,000 bushels; prior to that time, however, and as far back as 1880, the average was about 10,000,000 bushels each year. By taking an average of the available crop used for crushing, after adding the imports and deducting the exports, we find that the average consumption amounted to eight to ten million bushels of seed up to about the year 1892. From that time the statistics seem to show a steady increase in the consumption, until at the present time it would appear that from 22,000,000 to 24,000,000 bushels are crushed, or in the neighborhood of one and one-half million barrels of oil.

Price of Seed.—While at times the fluctuations of seed prices has been caused by heavy speculation and manipulation, the law of supply and demand has generally fixed the value. The earliest quotations of which we have an authentic record are for the year 1855; at that time Cincinnati was the principal centre for the sale of the seed. From about 1870 Chicago became the great market, its location being more central and better adapted for its marketing. Ten years later, however, Chicago lost its prestige, and Duluth, the wonderful city of the Northwest, has become practically the only market, located as it is at the head of the Great Lakes, which gives splendid shipping facilities for the large crop grown in the large states of North and South Dakota and Minnesota. The highest price obtained for linseed in modern times was in 1862, when sales were made on a basis of $3.25 per bushel. From 1862 to 1874 seed never sold under $2.00 per bushel but averaged about $2.50; after 1874, however, prices steadily declined until 1886, when $1.03 was reached. The lowest price ever obtained was in 1897, when seed went to about 63 cents. The greatest fluctuation was in 1862, seed going from $1.25 to $3.25, or a difference of $2.00. Flax seed has never fluctuated less than four or five cents a year, and this condition has prevailed but seldom. In speaking of the great increase in the crops of seed grown, it is interesting to note in a general way its peculiar migratory nature. In earlier times, almost all the seed was grown in the Eastern States; large amounts were grown in New York, whereas now scarcely any is grown there. Ohio long held a good share of the crop; from Ohio it traveled to Indiana and Illinois; then Kansas, and from there to Minnesota and Dakota, and finally, in the last few years, almost the entire crop has been grown in the great States of North and South Dakota, Minnesota, and Manitoba. The historical records furnish us with very meagre data as regards the number of mills in operation at different periods. In 1810, the census tells us there were 383 mills in 14 States, 171 in Pennsylvania alone. These mills of course were very small affairs, but the number is conclusive of the healthy growth and the large interest taken in this industry. These mills made 770,000 gallons of oil, valued at about $900,000. No better index of the growth of the industry can be had than a comparison of the following figures: In 1860 there were 94 mills, turning out nearly $6,000,000 worth of oil and cake; in 1870 the number of mills was reduced to 85, but the value of the products had increased to $9,000,000 worth of oil and cake, and in 1880, 81 mills produced $15,400,000 worth of products. The number of mills was still further reduced in 1890 to 62, making $23,500,000 worth of oil and cake, and in 1900 it is estimated that 48 mills were producing the splendid total of nearly $30,000,000. The steady decrease in the number of plants in operation is due of course to the weeding out of plants with poor and old fashioned machinery and those unable to work on the lowest basis of cost manufacture for various reasons. There are at the present time not over 30 mills in actual operation, and combining in the aggregate some 730 presses. In measuring capacity, the unit is generally a hydraulic press. Each press of standard size, containing 20 cakes, is capable of handling in the best managed mills about 40,000 bushels annually, if run 300 days in the year. As in many other industries to-day, there are two controlling interests concerned in the production of linseed oil, the combine and the independents. Between these two elements the annual crop of flax seed is crushed and placed on the market. The number of presses computed for the combine is about 360. The independents number about 410 presses, out of which number the three largest independents operate 236 presses, or about 60 per cent. A comparatively small number only of the above presses, however, are equipped with the full number of 20 plates; every mill, therefore, if run full could not crush the maximum of 40,000 bushels per press. Many mills have only 16 plates, and for the purpose of approximating the correct figures it will be safe to estimate that fully 60 per cent of the total number of presses operated have a capacity 80 per cent of the standard size. It will be seen, therefore, by computation, that on this basis the actual crushing capacity of all the presses in actual condition to run is over 27,000,000 bushels. As some few mills run a larger quantity by operating seven batches or more and running heavier cake, it is probable the actual capacity of the machinery in use is nearly 30,000,000 bushels, or from 6,000,000 to 8,000,000 bushels in excess of the amount required. Necessarily, such condition of affairs causes many of the mills to run only part of the year and some of them to shut down entirely. Not over ten years ago a mill containing 12 presses was considered a good size, and 24 presses was considered very large; in fact, there are very few mills in operation to-day that number more than the latter figure. The largest mill in the world is located in Buffalo, N. Y., and operating steadily the large number of 138 presses, having a capacity of 6,000,000 bushels of flaxseed, and turning out about 15,000,000 gallons of oil annually. The four principal crushing points, as shown by the number of mills and amount of crushing capacity, are Buffalo, Chicago, Minneapolis and New York, the number of presses in operation in Buffalo being 203, with a capacity of over 8,000,000 bushels of seed. Minneapolis is second with about 120; Chicago next with 113, and New York fourth with 108, or a total of 544 out of the entire number of 770 presses, the balance being scattered over the country at various points. See also FLAXSEED; OIL.

SPENCER KELLOGG,
Of Spencer Kellogg, Buffalo, N. Y.

Linsey, the name of an English country-made fabric of linen warp and worsted filling.

Linsey-woolsey, a mixed fabric made of linen and wool.

Linsley, James Harvey, American naturalist: b. Northford, Conn., 5 May 1787; d. Stratford, Conn., 26 Dec. 1843. He was graduated from Yale College in 1817, and became a Baptist clergyman, but on account of increasing ill-health resigned from the pulpit and devoted himself to the study of natural history. Many catalogues of mammalia and birds from his pen may be found in the ‹American Journal of Science.›

Linsley, Joel Harvey, American clergyman: b. Cornwall, Vt., 15 July 1790; d. Greenwich, Conn., 22 March 1868. He was graduated from Middlebury College in 1811, and was tutor there for three years; afterward studied law, but in 1822 was licensed as a Congregational clergyman and went to South Carolina as a missionary. During the years 1824–32 he was pastor of a church in Hartford, Conn., and was at Park Street church, Boston, 1832–5. In the latter year he was elected president of Marietta College, Ohio, which post he held 10 years, raising a considerable fund for the institution.

Linstock, a gunner's forked staff to hold a match of lint dipped in saltpeter.

Lint, in surgery, the scrapings or ravelings of fine linen, made into a sort of cloth, and used by surgeons in dressing wounds. It is made into various forms, which have different names, according to the difference of the figures. Lint made up in an oval or orbicular form is called a pledget; if in a cylindrical form, or in shape of a date or olive-stone, it is called a dossil. The advantages of this material are very great, owing to its softness of texture, the ease with which it can be folded or rolled into any shape required, its capacity to absorb discharges, and its cheapness, on account of which it may be thrown away when once used. For modern surgery, it is rendered antiseptic by steeping in carbolic acid, perchloride of mercury solution, etc., and subsequent drying.

Lint-doctor, a sharp-edged ruler on the delivery side of the calico-printing cylinder, to detain any lint or fibres which may come off the cotton cloth.

Lin'tel, in architecture, a horizontal timber or stone over a door, window, or other opening, to discharge the superincumbent weight.

Lin'thicum, Richard, American journalist: b. Libertytown, Md., 30 March 1859. He was educated in Baltimore schools and at Liberty Academy. From 1877 to 1880 he served as an observer in the United States Weather Bureau, and since 1883 has been engaged in writing for newspapers and magazines, to which he has contributed short stories, etc. He has also published ‹Rocky Mountain Tales› (1892); ‹Boer and Britisher in South Africa› (1900); ‹Best Recitations› (1902); and ‹Educational Encylopedia of Common Things› (1903).

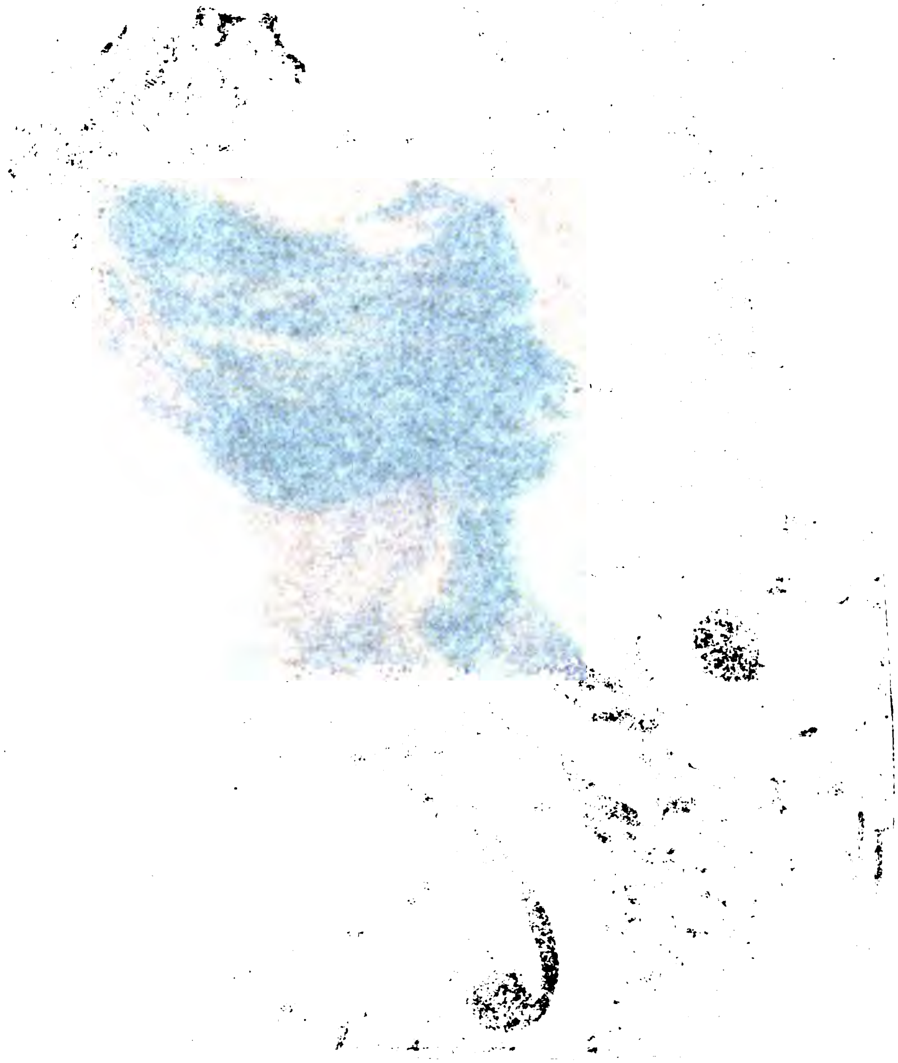
Lin'ton, Eliza Lynn, English novelist: b. Keswick, Cumberland, 10 Feb. 1822; d. London 14 July 1898. In 1858 she married William James Linton (q.v.), but they separated in 1867, though continuing to retain friendly relations until his death. She was connected with the press for nearly all of her literary career, writing for the ‹Saturday Review› the celebrated ‹Girl of the Period› papers. She sometimes dipped her pen in acid, but in private she was warm-hearted and self-sacrificing. Among her numerous works are: ‹The World Well Lost›; ‹The One Too Many›; ‹In Haste and at Leisure›; ‹The Girl of the Period›; etc. Her best novels are: ‹The True History of Joshua Davidson: Christian and Communist› (1872); and ‹Autobiography of Christopher Kirkland.›

Linton, SIR **James Dromgole,** English painter: b. London 26 Dec. 1840. He was educated at Cleveland House, Barnes. He afterward studied art, and has done much to promote the interests of the English school of water-color painting. He was elected a member of Institute of Water-color Painters (1867). When it was reorganized, its title being henceforth the Royal Institute of Painters in Water-colors, and its exhibitions being thrown open to everybody, not confined, as hitherto, to members, he was chosen president (1884). In the following year he was knighted. His pictures in oil include the «Marriage of the Duke of Albany» painted in 1885, and a series of panels illustrating 16th century history for a private mansion at Nottingham.

Linton, William James, Anglo-American wood engraver and author: b. London 1812; d. near New Haven, Conn., 29 Dec. 1897. As a wood engraver he took very high rank, and some of his finest work may be found in the pages of the 'Illustrated London News,' to which he frequently contributed from its commencement till he came to the United States in 1867. As an author, in which capacity he was more widely known than as an engraver, the zealous Chartism of his youth tinged much of his earlier work. Among his works may be cited: 'The Plain of Freedom' (1852); 'Claribel and other Poems' (1865); 'The English Republic'; 'Some Practical Hints on Wood Engraving' (1879); 'Life of Thomas Paine' (1879); 'A Manual of Wood Engraving' (1884); 'Poems and Translations' (1889); and 'The Masters of Wood Engraving' (1890).

Linz, lints, Austria, the capital of Upper Austria, on the Danube, 98 miles west of Vienna. It is defended by detached forts extending over a circuit of 9 miles, and has an old cathedral, a new cathedral, provincial parliament house, castle, town-house, bishop's palace, etc. The manufactures include woolen, linen, silk, and cotton goods, machinery and hardware, and there is an extensive trade on the Danube. Pop. (1900) 58,788.

Lion, the largest and most celebrated of the cat tribe, forming the widespread species *Felis leo*. The outward form and appearance of the lion are familiar. The apparently excessive size of the head, due chiefly to the great mane which covers the head, neck and shoulders of the males; the uniform, unmarked, tawny color of the skin; the great development of horny papillæ upon the rasp-like tongue; the growth of long hair on the elbows and along the middle line of the belly, and the tuft at the extremity of the tail (hiding a horny spine) are distinctive external characters. The length of the lion from nose to tip of tail, rarely, if ever, exceeds 10 feet, and that of the lioness 9 feet, of which the tail forms a third. The older books separated a supposed species of maneless lion, especially one in India designated the maneless lion of Gujerat; but the development of the mane varies greatly, some lions in all regions having this feature much more abundant than others, and in all cases it is a product of age, appearing fully only when the animal has reached full maturity at the age of five to seven years, so that no distinction of this kind is valid; nor can any be made upon color, the mane in certain specimens being very much darker than in others without regard to locality, dark and amply maned and scantily maned individuals belonging sometimes to the same litter. The period of gestation in the lions is five months. Only one brood is produced annually, and from two to four young are produced at a birth. The mother nourishes the whelps for about a year; their size at birth being about that of a pug-dog. In their young state the whelps may be marked with various markings; brown bands upon a tawny body color and a stripe along the spine, being most frequently observed. As they grow older, however, the markings disappear, and the uniform tawny hue of the adult is reached. The probable limit of age of the lion has been differently stated by different writers. Buffon fixed it at twenty-two years. But a lion which died in the Tower of London in 1760, had lived in captivity above seventy years. The habits of lions have been observed and described by more writers than in the case, perhaps, of any other animal; and they are known to vary constantly with circumstances, locality and the kind of prey available. In general this heavy animal, which is entirely unable to climb into trees, and frequents open rather than forested regions, gains its food by stealth and power rather than by agility and speed. Lions often go abroad by day, wandering and hunting widely; but are chiefly active at night. Then this great cat goes to some accustomed lurking place near a spring or by the side of a river, where, concealed among the brushwood, he lies in wait for the animals coming to drink. A single powerful leap generally lands him upon his prey which is crushed down by the weight of the attack and mauled and bitten about the head until the neck is broken by a wrench, or the veins and arteries are torn open. If no rivals are near, and the animal is very hungry, the prey may be devoured on the spot to the extent required to satisfy appetite; and then, after drinking copiously, the beast will usually go away to his lair, leaving the remains for his family, if they have come near (as often happens), or to hyenas and jackals. In most cases, however, the lion, like other great cats, chooses to take his quarry to some retired spot where he may feed upon it unobserved; and amazing stories are told, with apparent truth, of the strength displayed in carrying or dragging the carcasses of large antelopes, cattle and horses; it is not to be believed, however, as sometimes has been asserted, that a lion is able to «fling a bullock over its shoulder» and run away with it. Such a feat is limited to goats and small animals, if, indeed, it ever occurs. The lioness hunts by herself, especially when her kittens are young, at which time the father of the family is wandering alone, or with other males, and would be resisted if he attempted to join his spouse. The young remain with the mother until they are full-grown. The lion alone among cats is regularly polygamous, each male having three or four lionesses whose allegiance he gains by prowess in battle over rivals, and keeps by killing or driving off all newcomers. The result of these constant encounters in the arena of the desert is not only a scarcity of males but the continuous selection of the best to become progenitors of the race. One peculiarity of the lion developed by this incessant warfare among the males is the development of the defiant and terrifying voice which elevates the growl, and enlarges the scream, of other cats, into a tremendous roar — a volume of noise beyond that made by any other animal. The statement that the lion roars at stated periods appears to be almost wholly without foundation; in summer alone, and especially before storms, the lion roars before dawn. In rage the lion beats his sides with his tail, agitates his mane and facial muscles, protrudes the tongue and claws, utters the peculiar sharp, frequent growl, and altogether presents a very terrific appearance, all



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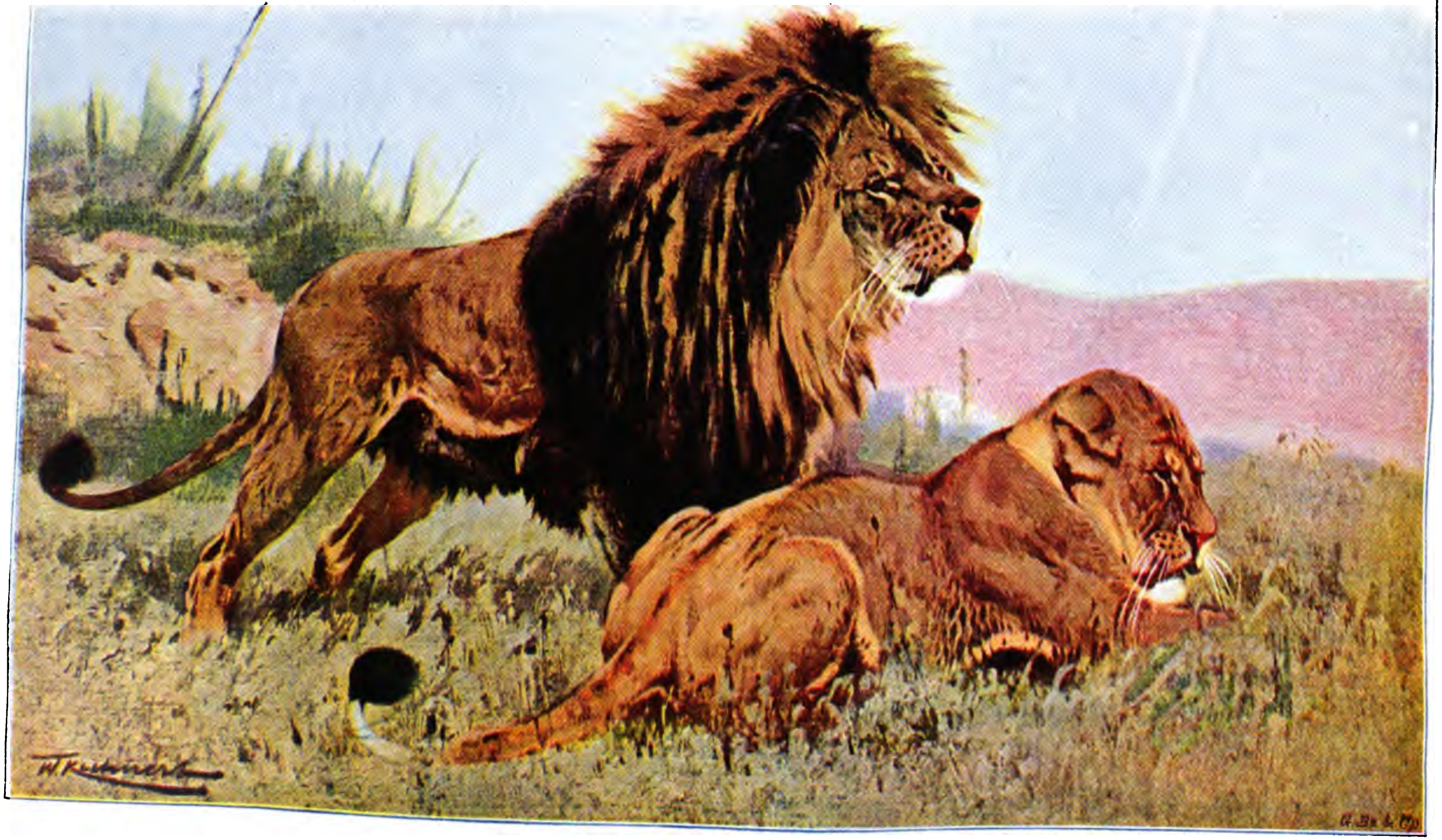

LION (*Felis leo*).

of which, primarily, has reference to the savage rivalry of males above described.

The natural disposition of all animals to get their food as easily as possible, has led lions everywhere to prey upon domestic cattle which, in a region where they are numerous, suffer nightly despoliation. Lions that have discovered this comparatively easy method of supplying their wants, soon learn that mankind is equally, or even more, readily obtainable, and become «man-eaters.» Beasts so sophisticated must be put out of the way; and barbarians organize great bands of men who learn the lair of the animal, surround it and effect the animal's death by any rude means possible. Some savage hunters boldly and skilfully overcome the lion almost in single combat, with rude weapons; and white hunters face him with no greater fear than attaches to encounters with many other large animals; yet the might of the beast makes him an exceedingly formidable foe. The incessant persecution to which the lion is subjected whenever a region begins to become civilized, has exterminated it over a large part of the former domain of the species. When men began to hunt in Europe in the Stone Age, they found there lions, whose remains, entombed in the floors of caves, are called those of «cave lions» (*F. spelæus*), but which present no important differences from the modern species. Within the time of written history lions dwelt in the mountains of southwestern Europe, and many of those seen in Rome in the time of the earlier Cæsars were obtained from the Danube Valley and Asia Minor. The supply was soon exhausted, however, and the later demand was met by importations from the Caucasus and southward, but mainly from northern Africa. In the arenas of ancient Rome, large numbers of lions were frequently exhibited. Sulla, the dictator, once exhibited 100 of these animals, and Pompey presented 600 in the circus; Hadrian caused 100 to be destroyed at one exhibition, and others of the emperors and consuls were equally prodigal. In order to provide these great quantities laws were promulgated protecting the beasts in the Carthaginian provinces, to the great detriment of agriculture there, and risk of the peasantry; and breeding establishments were created to produce enough lions to meet the imperial demand. The taming and training of lions have continued ever since, and to-day this great shaggy cat is the most impressive, if not the most intelligent, of the troupe which the menagerie showman gathers about him. For a long period almost all the lions exhibited in zoological gardens and shows have been those born in captivity, where the species breeds freely.

At the present day, few lions exist north of the Soudan and Abyssinia; and they have become extinct or scarce in the civilized regions of South Africa. They no longer exist in Asia Minor, but are numerous in the extensive marshes along the lower Euphrates and Tigris, and thence occur at intervals to the valleys of the Indus, where a few still remain in the wilder deserts of Cutch and Gujerat. Formerly they were known over all northern and western India.

Books of special value relating to lions and lion hunting are Flower and Lydekker's ‘Mammals, Living and Extinct’; Blanford's ‘Zoologies’ (of India. Persia and Abyssinia); Anderson's ‘The Lion and the Elephant’; Porter's ‘Wild Beasts’; and the hunting narratives of Gordon Cumming, Gerard, Harris, Holub, Baker and Selous.

Lion, lē-ôṅ, or **Lyons, Gulf of,** a large bay of the Mediterranean on the south of France, extending from the Spanish frontier eastward to the Hyères Islands.

Lipa, lē-pä', Philippines, a pueblo of the province of Batangas, Luzon, situated southwest of Lake Taal, 18 miles north of Batangas city. It is the junction of three important highways, all of which are old military roads, in excellent condition and always passable for heavy wagons. The town is therefore the seat of an important trade; sugar, corn and tobacco are produced, and there are drug stores and fine markets. It is one of the largest towns in the province; the people are very intelligent and progressive, and have established excellent schools; at one time a weekly newspaper was published. Pop. 14,000; municipality, 40,700.

Lipari, lē'pä-rē, or **Æolian Islands,** a group of volcanic islands in the Mediterranean, about 24 miles from the north coast of Sicily, situated between lat. 38° 20′ and 38° 55′ N.; lon. 14° 15′ and 15° 15′ E.; and comprised in the department of Messina. Pop. about 22,000. These islands called by the ancients Æoliæ, Vulcaniæ, and Insulæ Liparæorum, were supposed to be the residence of Æolus and Vulcan. Lipari, the largest, is populous and well cultivated, producing great quantities of corn and fruit, especially figs, grapes, and raisins; it likewise produces alum, sulphur, nitre, and cinnabar. It is about 15 miles in circumference; the air is healthful, the inhabitants industrious, and the males good sailors. On the eastern coast is situated a town of the same name, containing a castle built by Charles V., a cathedral, a college, several convents, and a hospital. A considerable trade is carried on in the principal produce of the island. The other islands are Stromboli, Panaria, Vulcano, Salini, Alicudi, and Felicudi, with two or three smaller ones. Volcanic eruptions ceased in the 6th century; but Lipari is composed of pumice-stone, lava, volcanic glass, and black sand; and the warm baths and heated vapors of the stoves (excavations which emit hot sulphurous exhalations) prove the activity of the subterranean fires.

Li″pogrammat′ic Compositions, are those in which certain letters are purposely omitted. Lope de Vega wrote a novel without an *l* or an *a*. Kotzebue wrote one without *r*.

Lipoma. See TUMORS.

Lip′pard, George, American novelist: b. Yellow Springs, Pa., 10 April 1822; d. Philadelphia 9 Feb. 1854. His most noted work was ‘The Quaker City’ (1845), modeled on Sue's ‘Mysteries of Paris,’ and implying that Philadelphia was a modern Sodom, though he disclaimed the inference when threatened with legal consequences. Other works by him were ‘Mysteries and Miseries of Philadelphia’; ‘The Empire City: New York — Its Upper Ten and Lower Million’; ‘Paul Ardenheim,’ a Rosicrucian romance; ‘Legends of Mexico’; ‘Legends of the Revolution’ (1847); ‘Washington and his Generals.’

Lippe, lĭp′pė, or **Lippe-Detmold,** Germany, a principality, bounded north, west, and south by Rhenish Prussia, and east by Hanover, Schaumburg-Lippe, and Hesse-Nassau; area, 438 square miles. It lies on the Teutoburger Wald, and is covered almost throughout by mountains and well-wooded hills, drained by the Werra, Bega, Exter, Ems, and by the Lippe. The climate is mild, but humid. Some parts of the surface are waste, or fit only for pasture, on which considerable numbers of cattle are reared; but others are fertile, producing corn, rape, hemp, and flax. The principal metal is iron, and there are quarries of limestone and gypsum, and valuable saline springs. Weaving is the chief industry, though there are also glass-works, several paper and numerous saw mills. The principal exports are wood, thread, linen, and wool. For administrative purposes it is divided into twelve bailiwicks, of which Detmold is the capital. The other chief towns are Lemgo and Horn. Since 1836 the government has been constitutional; it is a member of the German empire, and sends one member to the Bundesrath, and one to the Reichstag. Pop. chiefly Protestants (1900), 139,238.

Lippi, Fra Filippo del Carmine, frä fē-lēp'pō dĕl kär-mē'nä lēp'pē, Italian painter: b. Florence 1406; d. Spoleto 9 Oct. 1469. In his 15th year he entered the Carmelite monastery at Florence and early formed his style on the example of Masaccio, but was later influenced by Masolino, and Angelico of Fiesole (Fra Giovanni). In 1432 he left his convent, but without release from his vows. His relations with Lucrezia Buti, whether a nun or not, are largely unverified romances of Vasari, and modern biographers are not inclined to believe them. In his best work he united with the spiritual feeling of Fra Angelico of Fiesole, the strong historic imagination, energetic modeling, and unconventional loveliness of form and face, characteristic of Masaccio. His greatest masterpiece is in the parish church of Prato, and consists of a series of frescoes illustrating the life of St. Stephen, John the Baptist, etc. Many of his altar-pieces are now in the Florentine Academy. His last frescoes in the Cathedral at Spoleto were executed with the collaboration of Fra Diamante. Examples of this painter are also to be found in the galleries of Berlin, Munich, and Rome.

Lippi, Filippino, fē-lē-pē'nō, son of the preceding by Lucrezia Buti, Italian painter: b. Prato 1457 or 1458; d. Florence 18 April 1504. He was a pupil of Fra Diamante, but seems to have closely followed the artistic example of his father and Sandro Botticelli. Among his wall paintings, which show a wonderful advance beyond his predecessors, are those in the chapel of the Brancacci family at Florence, in which is portrayed the history of SS. Peter and Paul, and the decoration of the walls of the Church of Santa Maria Sopra Minerva, at Rome (1448–93) illustrating the life of Saint Thomas Aquinas. His masterpiece, however, is to be found at Florence in the Strozzi chapel of Santa Maria Novella, where his frescoes portray the legendary life of the Apostles Philip and John (1502). Some of his smaller canvases are in the galleries of Florence, Bologna, Berlin and Copenhagen.

Lippi, Lorenzo, lō-rĕnd'zō, Italian poet and painter: b. Florence 1616; d. there 1664. He published a comic epic poem in 12 cantos, ‘Il Malmantile vacquisdato’ under the anagrammatic pseudonym, «Perloni Zipoli» (1676). The poem abounds in rare humor and is written in light, swift verse. The language, however, abounds in Florentine provincialities, and is unintelligible without such a commentary as is furnished to the edition of 1688 by P. Munucci. As a painter he was an imitator of Santi di Tito's manner. There is a ‘Crucifixion’ of his in the Uffizi gallery at Florence; and ‘The Triumph of David’; and ‘Christ and the Woman of Samaria’ are in the Imperial gallery at Vienna.

Lippincott, lĭp'ĭn-kŏt, **Joshua Ballinger,** American publisher: b. Juliustown, N. J., 1816; d. Philadelphia 5 Jan. 1886. He was a bookseller in Philadelphia 1831–6 and in the last named year founded the house of J. B. Lippincott & Co., which by 1850 was at the head of the book trade in Philadelphia. After his death, in 1886, the firm was converted into the J. B. Lippincott Company. ‘Lippincott's Magazine’ was established in 1868.

Lippincott, Sara Jane Clarke, «GRACE GREENWOOD,» American writer: b. Pompey, N. Y., 23 Sept. 1823; d. New Rochelle, N. Y., 20 April 1904. She was married in 1853 to L. K. Lippincott of Philadelphia. She first became known as writer for young people over the signature «Grace Greenwood.» She edited for many years ‘The Little Pilgrim,’ a paper for juvenile readers, lectured on anti-slavery and other reform movements, and corresponded for various New York journals. She published ‘Greenwood Leaves’ (1850); ‘Poems’ (1851); ‘Merrie England’ (1855); ‘Records of Five Years’ (1868); and ‘New Life in New Lands’ (1873); ‘Victoria, Queen of England’; ‘Recollections of My Childhood’; etc.

Lippincott, William Henry, American artist: b. Philadelphia, Pa., 6 Dec. 1849. He began his art studies in the Pennsylvania Academy of Fine Arts, and his first professional appearance was as a book illustrator and later as a scene painter. In 1874 he became the pupil of Bonnat and for the eight years he remained at Paris exhibited annually in the Salon. The wide range of the work which he has done since he took up his residence in New York includes portrait, genre, landscape and scene painting, and he appears regularly as an exhibitor in the annual American art exhibitions. His most important pictures include ‘The Duck's Breakfast’; ‘Un Jour de Congé’; ‘Pink of Old Fashion’; ‘Helena’; ‘Infantry in Arms’; ‘Love's Ambush’; and ‘Pleasant Reflections.’

Lip'pitt, Charles Warren, American manufacturer and politician: b. Providence, R. I., 8 Oct. 1846. He was graduated from Brown University in 1865 and in 1869 entered his father's woolen establishment. He has held various local posts of honor, such as president of the Providence Board of Trade, 1881–2, and has been president since 1896 of the Rhode Island National Bank. He was governor of Rhode Island, 1895–7.

Lippmann, lĭp'man, **Julie Mathilde,** American author and critic: b. Brooklyn 27 June 1864. She received an academic education and began writing at an early age. She has contributed to the leading American magazines; and has written verse and juvenile stories. Her publications include ‘Through Slumbertown,

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.... 7,000,000
196,533,041

..............................$1,369,098,276
.... 1,273,212,386
.... 1,228,674,925
.... 1,146,897,822
.... 1,177,661,366

tities of the four leading beverages
r the year ending 30 June 1902,
ws:

Gallons
.... 1,498,910,304
.... 1,381,875,437
.... 396,420,115
ines...................... 157,206,554

report of the United States Bureau
shows the per capita consumption
this country:

irits lons	Wine Gallons	Beer Gallons	Total Gallons
51	.44	15.17	17.12
52	.48	16.20	18.20
34	.31	15.32	16.97
13	.28	15.13	16.54
01	.26	15.38	16.66
02	.53	14.94	16.50
12	.28	15.96	17.36
17	.35	15.28	16.80
27	.40	16.01	17.68
33	.37	16.20	17.90
36	.63	17.49	19.48

itinues to hold first place in the af-
ie American people. Its low cost
mand and makes it a formidable
alcoholic liquors and malt bever-
se of beer, wine and spirits shows
gain over 1901 — a notable fact in
great prosperity of the United
Beer; Coffee; Tea; Whiskey;

. See Licorice.

a term applied to alcoholic or
ids whether distilled or fermented.
iors are usually divided into three
he fermented, the malt liquors, and
liquors. The first of these include
and liquors which are made from
fruits and in which the natural
erted into alcohol by exposure to
The second class includes such
er and beer in which the starchy
re by certain processes changed
fore fermentation can take place.
vision includes brandies, whiskeys
whether these be derived from
n the distillation process is carried
y condensation and vaporization.
nufacture.— Wine needing no ma-
its manufacture is the oldest of
t was early made by the Greeks
who exercised the greatest care in
n, often flavoring it with spices
The early settlers of this country
about its manufacture almost simul-
th their landing, but it was not
380 that the wine industry received
and since that time it has rapidly

increased. The California wine industry which is little more than fifty years old gives employment to 60,000 persons and represents a combined capital of $72,200,000. The largest vineyard in California and also the largest in the world was owned by the late Senator Leland, founder of the Leland Stanford Junior University. It comprised nearly 5,000 acres.

Manufacture of Malt Liquors.— The consumption and manufacture of malt liquors in America increased very slowly principally on account of the introduction of tea and the household manufacture of ciders and fruit brandies. The manufacture of beer in the United States began about 1840, and the number of breweries for making of malt liquors has increased from 431 in 1850, to about 1600 in 1903. The development of this branch is due chiefly to the energy of the Germans. The chief cities for its manufacture are Milwaukee, St. Louis, Cincinnati, Rochester, Pittsburg and Kansas City.

Manufacture of Distilled Liquors.— The steady growth of this industry is not so marked as is that of wine and malt liquor manufacture. The distilleries are scattered about 28 different States, among which Illinois produces the largest amount, with Kentucky, Indiana, Ohio, Pennsylvania and Maryland following in order named. For statistical information see U. S. government reports 1903.

Lira, lē'ra̤, an Italian silver coin valued at about 18 cents in American money. It is the basis of the Italian monetary system; the gold coins are pieces of 100, 50, 20, 10, and 5 lire; the silver coins, of 5 and 2 lire, besides 1 lira and a half lira (50 centesimi); also lower coins in nickel and bronze.

Lĭr''ioden'dron. See Tulip Tree.

Lisaine, lē-zān, **Battle of,** an engagement of the Franco-German war, 15–17 Jan. 1871, on the banks of the Lisaine River near Belfort (q.v.). See Bourbaki Charles Denis Sauter.

Lisbon, lĭz'bȯn, Ohio, village, county-seat of Columbiana County; on the Beaver River, and on the Erie Railroad; about 130 miles northeast of Columbus. It is situated in an agricultural region with extensive coal-fields in the vicinity. Sheep and cattle raising, the cultivation of grain and vegetables, and mining are the prominent occupations in this section. Lisbon is the trade centre for a large portion of the county. The village owns and operates the waterworks. The public library has about 4,000 volumes. Pop. (1890) 2,278; (1900) 3,330.

Lisbon, Portugal, the capital and principal seaport on the right bank of the Tagus, about 9 miles above its mouth. It is built on a succession of hills, rising from the quays in the form of an amphitheatre. The streets of the olders parts, more especially in the east, are steep, narrow, crooked, badly paved, and dirty; the houses, with a few exceptions are old-fashioned and mean. The modern portion, however, which lies on even ground, in the valley between the Monte do Castello on the east, and the hills of San Francisco and Do Carmo on the west, consists of several parallel streets crossed by others at right angles, and is regular, well built, clean, traversed by street railways, electrically lighted, and provided with a telephone service. Of these the D'Ouro (Gold), Do Prato (Silver), D'Augusta, Do Chiado (Cloth) streets extend about one half mile, north to south, hav-more of these improvements. America leads the world in prosperity because it led in adopting standard sizes for parts of machinery and in other labor-saving methods and devices. Obviously by as much as services of high salaried men who work at desks are more valuable than those of mechanics, by so much are literary labor-savers worth more to the world than the highly prized machines of manufacture and commerce. Yet it was not till a library supply bureau was founded in Boston in 1876 that this was practically recognized. Since then there has been marvelous development, till now a device for saving money, time or labor in office, library or study is valued as highly as one for factory, shop or farm.

This article aims to be practical, not historical, and to call attention to a few less prominent things useful to those aiming to accomplish most intellectual labor with their time and strength. Space allows only dogmatic statements when convincing reasons based on long tests and special studies could easily be given. These experiments are constantly in progress in connection with the New York State Library School, at Albany (see LIBRARY SCHOOLS), which has in its museum of labor-saving methods and appliances the entire collections and World's Fair exhibits of the American Library Association organized in 1876, the aim being to give information as to which of the countless devices and new methods are really worth adoption.

Hundreds of ingenious, practical labor-savers for technical uses will be brought to attention of those needing them by their promoters. Electric and other tabulating and computing machines illustrate immense savings made possible by such devices, which are as important to desk workers as sewing-machines to seamstresses or improved tools to mechanics. If the principle is admitted that time and labor should be saved for brain work as for hand work, it follows that the minutest saving is worth attention. Many factories make their entire profit by using an improved method or machine, or by utilizing waste in some by-product. In offices with many clerks, a method by which four motions do the thing formerly taking five, saves a considerable aggregate in salaries each year.

Writing and Printing.— Writing is easily the greatest of human inventions. All nations recognize this in their traditions by attributing to it divine origin. Some 5,000 years ago Egyptian priests evolved pictures of things into ideograms or pictures of abstract qualities and ideas, then pictures for sounds of words or syllables (where some Eastern languages still stop); and finally pictures for sounds of final elements or single letters. The surfaces on which these were written were evolved from stone, horn, clay, metal, wood, wax, bamboo, and birch-bark, skins, and papyrus, till we reached that wonderful product, paper. The first writing implement, of flint, was followed by the stylus, fine brush of hairs, split reed, quill, steel and gold dip pens, which in turn are now being superseded by fountain pens and typewriters. After inventing writing, the ancients devised abbreviation systems as labor-savers. Then came the faster forms of letters for cursive writing which we call small or lower case. Taking less space and being both written and read more quickly, they have already largely displaced capitals, with a growing tendency to displace them still farther. The next step was a combination of greater abbreviation and greater simplifying of forms by stenography, which was revolutionized and systemized by Isaac Pitman. (See STENOGRAPHY.) The greatest invention after writing was printing, followed by telegraph, cable, and telephone, which, in universal use, suggest what the human mind has already done and possibilities of farther growth.

Model Office or Study.— A southeast corner room is best; north light is most uniform; west least desirable. Health forbids carpets in public rooms. Use hardwood floors, or corticine, which is cheap, durable, easily washed, deadens noise, and is warm. Hot water is best for heat, being free from the quick changes and annoying cracking usual in steam. For ventilation, have both inlet and outlet flues, with open fire if practicable. If not, insure circulation through flues by gas jets, pipes, or motors. Desks should stand with windows at left. The popular roll-top darkens the desk top. The roll, if needed, is better over pigeonholes, which are best for space in front of the chair if one has many papers, as they allow the largest number of boxes to be reached most quickly. Pigeonholes are best where quick work is the chief end, but catch more dust than drawers and take more space than vertical files which hold on edge papers, pamphlets, and clippings, and are cleanest, cheapest, and best for most storage. Space not needed for pigeonholes in front of the desk is best used for vertical files or drawers. Telephone and desk light (with green porcelain shade to protect the eyes) should be on arms, to swing out of the way when not in use, and save desk space. Standard size pigeonholes, drawers, trays, and shelves should fill all blank wall space at left and behind, within reach from the swivel-and-spring desk chair. Some find a chair with curved spring back a help. Upholstery is heating and sometimes dangerous for constant use.

A model desk is 78 cm high, not 75 as is common. Drawers run to floor without baseboard and clear through to back and have side runs with no cross pieces. At no extra cost this gives easier action and maximum storage. All drawers are at least 9 cm deep inside to hold standard card trays. The centre opening for the feet is at least 60 cm wide with a centre drawer large enough for 50x60 cm standard large sheets often needed for charts and tables. Rows of drawers each side the chair have slides above them, as long as possible. On small desks extension leaves supported by folding brackets may be added to either end. Tops are 60 to 100 cm wide. The usual length, 150 cm [60 in.] is the largest top easily reacht from the chair.

Office bells should be single stroke, not buzzers, to allow simpler codes of time-saving signals. Barometer or fountain sponge cup and mucilage stands save labor. If inkstands are used, the Perfect or some other pattern that prevents evaporation and so requires no refilling till ink is all used, is important. Self-inking rubber stamps for any words or dates often written save much time and give more distinct entries. If several are used they must be kept in racks plainly labeled or it takes as long to find the right one as to write the words. A metal

deep to
an 8 mm
middle. For
in public indexes
is often needed to
special uses. Rods are
and loss, so that a notch
is bad, as cards can be
readily removed without tearing.
binder with eyelets opposite the card
a tie cord and bar is the handiest way to
cards. The best card stock, weighing 200

to a square metre, is as good as the older 300 or 400 gram stock which took twice the space. Heavier cards are needed only for guides. These with projecting tabs more than double usefulness. Cards as well as guides can be had with these tabs, affording immense possibilities of double, triple and quadruple classification by tab, card color, ink color, and number or heading. For lighter cards 133 gram stock, two-thirds the weight of the light standard, is best. With it 300 times as many cards can be put in a floor space as with the simplest combination of old outfits. The 100 gram stock, which is ordinary five-pound commercial note-paper, is also used where space saving and cheapness are more important than ease of handling.

The largest standard card index is L size, for cards 25 cm high by 20 cm wide. The drawers are 21.5 wide and 28 cm high inside, and outside are 27.5 x 30 cm by 50 cm long. They have rods and blocks with sides cut away like the P size, but drawers are on extension slides so that they can be opened to their full length. The unit is four drawers high from the floor, the highest that can be readily consulted standing. The best low unit is two L drawers high with a P drawer and an extension slide and table top above, making a case 78 cm high, 32 cm wide and 50 cm long. This stands at the end of a desk as an extension, or better at right angles, so all cards may be read without rising from the chair. Heavy manila guides 27 cm high have tabs 4 cm wide projecting 1 cm higher. Another projection from the middle of the bottom runs in a groove in the drawer bottom and has a stout eyelet through which the locking rod runs, a necessity for so large cards. For these large sheets two folios not used in P size are needed. A manila envelop 20.5 x 25.5 cm, open at the top and right side, holds together stiffly enough to hold thin papers on edge. The long folio is of manila 20 cm wide, 51 cm long, folded with front 24 cm, back 27 cm high. In the top smaller subdivisions than indicated in the projecting tabs of the guides are written and closer classification of the papers is maintained. Manila, white, blue, buff and other colors are used for these folios when more than one classification is wanted in the same series, for example, personal papers mingled with office or firm papers on the same subject. Thus papers belonging to a half-dozen different parties can be closely classified together by subjects without confusing ownership which is instantly recognized by the folio color. This L size index fits most magazines, pamphlets, letters and typewritten documents and is the best working unit for all papers too large for P trays. It is much preferable to filing on the long edge because papers may be read in the drawer with letterheads, titles of articles, etc, at the top in the best light, exactly like

largely
(15 cm
great
from this
versally used. The
index stock is 50 x
aliquot parts of this
Ninety-nine times out of one
L size will be better than any
sizes are more expensive and
when indexes are combined or
other sizes must be had for special use,
should be chosen from this full series:

Symbol	Name	Size in cm.
V	Visiting card	5 x 7.5
H	Half P	6.25 x 7.5
I	Index	5 x 12.5
P	Postal	7.5 x 12.5
B	Billet	10 x 15
D	Double P	12.5 x 15
N	Note	12.5 x 20
3P		12.5 x 22.5
4P		15 x 25
L	Letter	20 x 25

Arrangement in any card system is either A to
Z, like a dictionary, or 1, 2, 3, or classified, both
numeric and classed plans having alphabetic in-
dexes on P cards. The numeric system is best
for correspondents writing many letters or for
special contracts or other business distinct but not
obviously classed under any subject or name. For
this use the short numbers 1 to 9 or 99 should be
reserved for the heaviest correspondence. The
rest are assigned and indext as subjects arise,
the folios being kept in 1, 2, 3 order. They can
be filed or found much quicker than by any
other than Arabic notation, which is the simplest
known to the human mind. The numeric file is
very bad in scattering by accidental order matter
on allied subjects which ought to stand side by
side. Every system should have an alphabetic
supplement for miscellaneous correspondents
who write few letters, since it is self-indexed
and its few papers are put away and found again
more quickly than if classified or numbered
and indext. A great file of papers is like
a library in miniature. Experience the
over has proved that while alphabetic
numeric systems are invaluable for many
poses, usefulness demands close classing
material grows. The best plan is to
simplicity of numeric and utility of
as in the 'Decimal Classification and
tive Index', used by most libraries. The
plest possible printed index of 20,000
tells instantly by what number to mark or to
any paper, for example, bees are marked
This means sixth class Useful Arts, third
Agriculture, eighth section Bees. Every

deep to hold these trays. All cards should have an 8 mm hole near the lower edge, in the middle. For private use locking rods needed in public indexes may be omitted, but the hole is often needed to tie cards together or for special uses. Rods are to prevent removal and loss, so that a notch in place of a hole is bad, as cards can be bent a little and readily removed without tearing. A pocket binder with eyelets opposite the card holes and a tie cord and bar is the handiest way to carry cards. The best card stock, weighing 200 grams to a square metre, is as good as the older 300 or 400 gram stock which took twice the space. Heavier cards are needed only for guides. These with projecting tabs more than double usefulness. Cards as well as guides can be had with these tabs, affording immense possibilities of double, triple and quadruple classification by tab, card color, ink color, and number or heading. For lighter cards 133 gram stock, two-thirds the weight of the light standard, is best. With it 300 times as many cards can be put in a floor space as with the simplest combination of old outfits. The 100 gram stock, which is ordinary five-pound commercial note-paper, is also used where space saving and cheapness are more important than ease of handling.

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Intermediate sizes are seldom needed. B or billet (10 x 15 cm), N or note (12.5 x 20 cm) are largely used, but a single size, D or double P (15 cm high by 12.5 cm wide), is best and has the great advantage that a single fold makes a card from this exactly fit standard P trays now universally used. The standard large sheet for card index stock is 50 x 60 cm and to save waste aliquot parts of this should always be chosen. Ninety-nine times out of one hundred P, D or L size will be better than any other, and odd sizes are more expensive and often wasteful when indexes are combined or rearranged. If other sizes must be had for special use, they should be chosen from this full series:

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4P		15 x 25
L	Letter	20 x 25

Arrangement in any card system is either A to Z, like a dictionary, or 1, 2, 3, or classified, both numeric and classed plans having alphabetic indexes on P cards. The numeric system is best for correspondents writing many letters or for special contracts or other business distinct but not obviously classed under any subject or name. For this use the short numbers 1 to 9 or 99 should be reserved for the heaviest correspondence. The rest are assigned and indext as subjects arise, the folios being kept in 1, 2, 3 order. They can be filed or found much quicker than by any other than Arabic notation, which is the simplest known to the human mind. The numeric file is very bad in scattering by accidental order matter on allied subjects which ought to stand side by side. Every system should have an alphabetic supplement for miscellaneous correspondents who write few letters, since it is self-indexed and its few papers are put away and found again more quickly than if classified or numbered and indext. A great file of papers is like a library in miniature. Experience the world over has proved that while alphabetic and numeric systems are invaluable for many purposes, usefulness demands close classing as material grows. The best plan is to combine simplicity of numeric and utility of classed as in the 'Decimal Classification and Relative Index' used by most libraries. The simplest possible printed index of 20,000 headings tells instantly by what number to mark or to find any paper, for example, bees are marked 638. This means sixth class Useful Arts, third division Agriculture, eighth section Bees. Every paper middle and bottom of pages; 3 and 7, points half way between top and middle or middle and bottom, while even numbers are mere modifiers of these positions, 2 denoting a point a little below the top, 8 a point a little above the bottom; 4 and 6, points just above and below the middle. If there are several columns on a page, use two superior figures, the first denoting column and the second position in the column; for example, $7{:}89^{18-28}$ means vol. 7, p. 89, beginning in the third ninth of column 1 and ending near the bottom (in the eighth ninth) of column 2. In condensed matter use the library date system: (1) Day of week, (2) day of month, (3) month, (4) year.

Months				Days	
Ja	Ap	Jl	O	Su	Th
F	My	Ag	N	M	F
Mr	Je	S	D	Tu	St
				W	

For Wed. 9 Sept. 1885, write W 9 S 85.

Numbers for months are dangerous. As usage is about equally divided, no one can tell whether 6–7 means July 6 or June 7. The L. B. dates above are exact and average fewer marks.

Numbers.— Use only Arabic numerals and letters and avoid the clumsy and easily misread Roman numerals; for example, Vol. 88, not Vol. LXXXVIII.

Newspaper Clippings.— These are almost useless unless closely classified. Plain manila sheets 20 x 25 cm are better than any patent scrapbook. They are classed like other papers with subject number on left upper corner and are kept laced in binders or much better in L drawers like thin pamphlets, thus bringing clippings, circulars, letters and notes on each minute topic all together in one folio.

Metric System.— John Quincy Adams reported to Congress that if metric weights and measures could be generally used they would be a greater labor-saver to the human race than steam. Since then nearly all civilized nations have adopted these measures, and America and England are both nearing such adoption. The international decimal system, agreeing perfectly with our arithmetic, stands near the head as a labor-saver. Computation showed that a single railroad could save $50,000 a year in clerical labor by its use.

Colon Forenames.— In library catalogs where space is important, the most common full names are indicated by initials followed by a colon or double period, thus C:H:Smith is known to be Charles Henry Smith, while C. H. Smith may have any names beginning with C. or H. With no extra space or cost the full name is accurately given by adopting C:A. Cutter's library list below:

A:	Augustus.	A..	Anna.
B:	Benjamin.	B..	Beatrice.
C:	Charles.	C..	Charlotte.
D:	David.	D..	Delia.
E:	Edward.	E..	Elizabeth.
F:	Frederick.	F..	Fanny.
G:	George.	G..	Grace.
H:	Henry.	H..	Helen.
I:	Isaac.	I..	Isabella.
J:	John.	J..	Jane.
K:	Karl.	K..	Kate.
L:	Lewis.	L..	Louisa.
M:	Mark.	M..	Mary.
N:	Nicholas.	N..	Nancy.
O:	Otto.	O..	Olivia.
P:	Peter.	P..	Pauline.
R:	Richard.	R..	Rebecca.
S:	Samuel.	S..	Sarah.
T:	Thomas.	T..	Theresa.
U:	Ulrich.	U..	Ursula.
V:	Victor.	V..	Victoria.
W:	William.	W..	Wilhelmina.
		Z..	Zenobia.

Nine tenths of matter usually kept flat in drawers is better kept on edge in L size vertical files which are handiest and cheapest except for papers in constant use in open pigeonholes; cards in P trays and books and pamphlets on shelves. The best library shelf is 75 cm long, 20 cm deep and 25.5 cm high, thus taking all books up to octavo 25 cm. Cases should be seven or eight shelves high with 15 or 20 cm ledge, if wished, above the three lower shelves. The best pamphlet case is a plain wood box covered with marble paper, open only on the back. This is handier and more durable than costly patent boxes. Shelves, pigeonholes and blanks should all be read from top to bottom and from left to right like the columns of a newspaper, never jumping over the upright.

The most practical, cheapest and oftenest needed labor-saving is to use the fewest words and marks that will convey meaning readily and accurately.

MELVIL DEWEY,
Director New York State Library.

Literary Property. See COPYRIGHT.

Literature, American. See AMERICAN LITERATURE.

Literature, Canadian, comprises, in its widest acceptation, those phases of French and English literature, which, with indigenous assimilation, have developed during and since the period of Canadian colonization and settlement. In its earliest stages it consists of the recitals of the discoveries and explorations of the early French explorers and Catholic missionaries, and the transported and localized traditions of the first Breton and Norman peasant immigrants, accumulated and crystallized during successive generations, until they reach the present century in a collection of literature of unsurpassed interest. After Canada became a British possession by the Treaty of Paris in 1763, side by side with the continued development of French-Canadian literature, which naturally was confined to the settlers of French origin in the Province of Quebec or Lower Canada, there arose an Anglo-Canadian literature fostered by the early British settlers, who were presently reinforced by the advent of United Empire loyalists that, on the close of the Revolutionary War, left the United States, and settled in the maritime provinces of New Brunswick and Nova Scotia, and in Ontario or Upper Canada. During the first half of the 19th century these growing branches of Canadian literature followed their independent yet parallel courses, until after 1841, with the union of Upper and Lower Canada, and later with the confederation of the provinces, they found a common interest in the patriotic expression in both languages of the newly awakened sentiment of nationality, which has become so important a factor in the political and general life of the Dominion. Canadian literature in all its branches includes not only authors of native origin, but also certain writers of other nationalities, who, having come to settle or reside in the Dominion, and to be imbued by sentiments and interests wholly Canadian, have enriched it with their contributions.

Christie; Annie Rothwell, poet and novelist; G. G. Currie, ‘How I Once Felt: Songs of Love and Travel’; S. A. (Mrs.) Curzon, ‘Laura Secord, the Heroine of 1812,’ a drama; E. H. Dewart, ‘Songs of Life,’ ‘Selections from Canadian Poets’; A. G. Doughty; W. H. Drummond, ‘The Habitant,’ ‘Johnnie Courteau and other poems’; A. W. H. Eaton, ‘Acadian Legends and Lyrics’; C. (Miss) Fairbanks; J. K. Foran, ‘Poems and Canadian Lyrics’; C. S. Goodhue; J. M. Harper; S. F. (Mrs.) Harrison, ‘Pine Rose, and Fleur de Lis’; C. Heavysege, ‘Saul’; S. M. A. (Mrs.) Hensley, ‘A Woman's Love Letters’ (1895); S. Hunter-Duvar; J. Imrie; E. P. (Miss) Johnson; R. K. Kernighan, ‘The Khan's Canticles,’ etc.; W. D. Lighthall, poet and novelist, ‘Songs of the Great Dominion,’ etc.; A. J. Lockhart; C. Mair; G. Martin, ‘Marguerite, or the Isle of Demons’ (1887); S. (Mrs.) Moodie, sister of Agnes Strickland; M. (Miss) Morgan; A. Muir, ‘The Maple Leaf Forever,’ ‘Canada, Land of the Maple Tree,’ ‘Canada Forever,’ etc.; G. Murray, ‘How Canada was Saved,’ etc.; E. MacColl; D. McCaig, ‘Milestone Moods and Memories’; W. McLennan, ‘Songs of Old Canada,’ etc.; T. O'Hagan, poet, critic and essayist, ‘Songs of the Settlement,’ ‘Canadian Essays,’ etc.; T. H. Rand, the Canadian Browning, ‘At Minas Basin and other poems’; J. J. Roche, ‘Songs and Satires’; C. Ryan, ‘Songs of a Wanderer,’ etc.; F. G. Scott; D. C. Scott; A. M. Sinclair; E. H. Stafford; B. Straton; J. S. Thompson, ‘Estabelle and other Verse,’ etc.

Although of native birth and claimed as a Canadian writer, Grant Allen, novelist and naturalist, is typically Anglo-Saxon in the universality of his works, fictional and otherwise. The greatest writer of fiction Canada has produced is Sir Gilbert Parker (q.v.), the literary discoverer of the Northwest, who in ‘Pierre and His People’ (1892), ‘When Valmond came to Pontiac’ (1895), ‘The Seats of the Mighty’ (1896), and ‘The Right of Way’ (1901), has anglicized French-Canadian themes with a vigor and interest of world-wide appeal. Even when he has sought elsewhere for his locale, his characters curiously betray a mixed colonial influence of Canadian origin, as in ‘The Battle of the Strong,’ the scene of which is laid in the Island of Jersey, whence came the ancestors of many early Canadian colonists, represented in the Canadian literary world at this day by, among other descendants, J. E. Le Rossignol, noted for his philosophical and other essays, and W. D. Le Sueur, whose literary and critical essays on Matthew Arnold, Bernardin de St. Pierre, Saint-Beuve, etc., are of a high order. Among other writers of native fiction are G. M. Adam with A. E. (Miss) Wetherald in ‘An Algonquin Maiden’; K. M. (Miss) Barry, numerous novels, including ‘Honor Edgeworth,’ ‘Ottawa's Present Tense,’ ‘The Doctor's Daughter, a Sketch of Canadian Social Life and Character’; R. (Miss) Barry; M. H. (Mrs.) Catherwood; P. Cox, artist and author of ‘The Brownie Books,’ etc.; S. J. (Mrs.) Cotes, ‘A Social Departure’; F. B. Crofton, ‘The Major's Big Talk Stories’; A. Davies, ‘Canadian Short Stories’; L. (Miss) Dougall, ‘Beggars All’; E. L. (Mrs.) Estey; J. Galt, ‘Laurie Todd, or the Settlers in the Wood’ (1830); J. B. (Mrs.) Hammond; S. F. (Mrs.) Harrison; H. E. (Mrs.) Hayes (Mary Markwell); T. S. Jarvis, ‘Doctor Perdue,’ ‘The Ascent of Life,’ etc.; A. R. (Mrs.) Logan, ‘Children of the Hearth’; B. L. (Miss) Macdonell, ‘Tales of the Soil,’ etc.; J. N. (Miss) McIlwraith (Jean Forsyth); W. McLennan; E. J. (Miss) McManus; G. A. (Mrs.) Newhall; J. M. Oxley; J. Richardson, ‘Wacousta, or the Prophecy’ (1833); J. A. Phillips, ‘Out of the Snow,’ etc.; R. Pocock, ‘Tales of Western Life’; M. A. (Mrs.) and A. T. (Miss) Sadlier; M. M. (Miss) Saunders, ‘Daisy’ (1892), ‘Beautiful Joe’ (1894); E. E. Sheppard; E. W. Thompson; H. B. Willson; E. R. Young; Charles G. D. Roberts, historical novels, and animal stories; Ralph Connor (Rev. Chas. Gordon); Norman Duncan; A. R. Carman; Joanna Wood; Virna Sheard; W. A. Hickman; Alice Jones, etc.

The list of notable Canadian essayists and miscellaneous writers in all branches of theology, philosophy and science is too long to be included here, but of purely literary critics and essayists, besides W. D. Le Sueur already mentioned, may be cited W. J. Alexander, R. G. Haliburton, T. A. Haultain, N. F. Davin, S. E. Dawson, A. M. MacMechan, T. O'Hagan, L. J. A. Papineau, T. Watson, etc., while in the collected and published speeches of Joseph Howe, Sir Wilfrid Laurier, Alexander Mackenzie, Sir John Macdonald, Sir Charles Tupper, etc., Canada has a rich anthology of oratorical literature.

Consult: G. M. Adam, ‘Outline of Canadian Literature’; Bourinot, ‘Canada's Intellectual Strength and Weakness,’ and ‘Intellectual Development of the Canadian People.’

J. MacDonald Oxley, B.A., LL.B.,
Author of ‘The Romance of Commerce,’ etc., Toronto.

Lith'ia, in chemistry, oxide of lithium (q.v.).

Lithia Mica. See Lepidolite.

Lithic Acid. See Uric Acid.

Lith'ium, a name applied to an alkali discovered in the year 1817. Lithia has since been detected in spodumene, lepidolite, triphylite, amblygonite, tourmaline, meteoric stones, mineral waters, coffee, tea, blood, milk, etc. A process for procuring it is the following: One part of petalite or spodumene in fine powder, is mixed intimately with two parts of fluor-spar, and the mixture is heated with three or four times its weight of sulphuric acid, as long as any acid vapors are disengaged. The silica of the mineral is attacked by hydrofluoric acid, and dissipated in the form of fluosilicic acid gas, while the alumina and lithia unite with sulphuric acid. After dissolving these salts in water, the solution is boiled with pure ammonia to precipitate the alumina; is filtered, evaporated to dryness, and then heated to redness to expel the sulphate of ammonium. The residue is pure sulphate of lithium. Its color is white; it is not deliquescent, but absorbs carbonic acid from the air; it is soluble in water; it is acrid and caustic, and acts on colors like the other alkalies; heated with platinum it corrodes it rapidly. It combines with the different acids, and forms crystallizable salts with them. The phosphate and carbonate are sparingly soluble; the chloride is deliquescent and soluble in alcohol, and this solution burns with a red flame. Unlike the other alkalies it cannot be reduced from its car-found the first permanent establishment in Paris. This was in 1816. In 1837 he was granted letters-patent on the invention of chromolithography. The first house in Berlin was established in 1834 by Franz Hanfstängel, and in London in 1822, by Hullmandel, a pupil of Engelmann of Paris. Senefelder himself attempted to establish himself in London, but failed, owing to some difficulty with his partner, André, of Offenbach.

Lithography as an art reached its climax in Paris during the reign of Louis Philippe. Among the masters who distinguished themselves were the satirists Daumier, Grandville, Travies and Gavarni, Deveria, Delacroix, Johannot and Gigoux, the delineators of romantic literature; Charlet and Raffet, who found material in the glorification of Napoleon's career. Other painter-lithographers of the day were Géricault, Richard Park Bonington, James Duffield Harding, Eugene Isabey, Alexandre Calame and Julien, whose ‹Etudes en Deux Crayons› made his famous. Since the introduction of the power press and the consequent development of the lithographic industry as a commercial factor, the medium of lithography has found less favor as a mode of artistic expression, but efforts are now being made to create renewed interest in an art so true in its reproduction of the artist's pencil. Commercially it has grown to be one of the most important branches of the printer's craft, as evidenced by the fact that in the United States alone, according to the census of 1900, the capital invested was $22,676,142, and employment was given to almost 14,000 people.

Materials.— The stone used for purposes of lithography is a compact, homogeneous limestone of porous texture, known as «lithographic stone.» It varies in color from a light cream, dull yellow, drab or gray to darker shades of the same colors, the best being found among the light gray varieties. The dark blue-gray or French stone is very fine in texture, but is not favored generally by either the artist or the transferrer, as its color does not contrast sufficiently with that of the design to enable the manipulator to gauge his work as well as on a light gray stone. Lithographic stone is quarried chiefly at Solenhofen, Germany, and while similar stone has been found in England, France and America, none possess the quality of the Solenhofen product. It is sawn at the quarries into slabs of from 3 to 4 inches in thickness, varying in size from 6 x 8 inches to 44 x 64 inches, and is sold by weight. The cost, as compared to its area, increases, not simply arithmetically, in proportion and weight, but in geometrical progression, as in the case of diamonds and other precious stones. Thus a stone measuring 3 x 4 inches, weighing 20 pounds, costs 1½c per pound, and a stone measuring 44 x 64 inches, weighing 1,200 pounds, may cost as much as 40c per pound. The common occurrence of hidden flaws in stones, leading to fracture under pressure when printing therefrom, and the difficulty of securing large stones without blemishes, such as chalk spots or veins, has been a source of constant trouble. For this reason, as well as owing to the expense incurred in handling and storing the cumbersome stone, a substitute embodying the same properties has been the desideratum of lithographers almost since the invention of surface printing. Zinc has been in use for 50 years or more, and while it possesses the necessary qualities to a limited extent, it has never proved useful for any but the most ordinary grades of work. Other metals and materials, as well as artificial stones have been tried, but none were found suitable, until with the introduction of aluminum as a trade article, experiments with that metal were made by John Mullaly, of New York, and later by Otto C. Strecker, of Mainz, Germany, resulting in the almost universal adoption of this metal as a perfect substitute for the lithographic stone. Designs can be removed from either stone or metal plates and their surfaces prepared for the reception of new designs. A stone 4 inches thick or an aluminum plate 29/1000 of an inch thick can thus be used approximately 200 times. Lithographic crayon is composed of beeswax, shellac, tallow, mastic turpentine, soap and lampblack. It is made in several degrees of hardness. For crayon work the surface of the stone is always grained by means of grinding with clean, sharp sand and water between two slabs of stone. Lithographic ink adapted for pen work on stone contains the same ingredients as used for the crayon with a larger quantity of the soap, in order to make it soluble in water. The ink is furnished in sticks and rubbed over a plate or saucer and then gradually dissolved with water or turpentine until it becomes fluid. Gum arabic and acids are important factors in lithography; in fact, Senefelder's original invention would have proved of little practical value had he not also discovered their uses in reinforcing the qualities of the stone. When a drawing is completed on stone, its surface is treated with a solution of gum arabic and nitric acid, effecting a chemical change in its nature where it is not protected by the grease or ink of the drawing. The carbon is freed and a nitrate deposited in the form of a full grained pellicle, the pores of which retain the gummed water, thus creating a surface impermeable to grease. Furthermore, the drawn parts are rendered insoluble in water by decomposing the alkali contained in the soap — one of the component parts of lithographic crayon or ink. The object of this etching is not to elevate the drawing — the relief, if any is obtained, being hardly perceptible, and although it tends to make the impression cleaner and sharper, is not absolutely necessary.

Process.— After the stone is etched, it is washed successively with water and turpentine. When wiped clean, the surface at first glance appears to be perfectly blank, but on closer inspection shows a faint suggestion of the design in white on the face of the stone. After being repeatedly moistened and rolled in with printing ink, the design reappears and accepts the ink. It is then covered with a weak solution of gum arabic and is ready for printing. A drawing on stone is necessarily reversed and it requires considerable experience on the part of the artist to obtain proficiency in thus rendering a reverse facsimile of the original. In the hands of an experienced and capable artist no reproductive art can offer greater possibilities than that of crayon drawing on a grained stone.

[illegible] Paris, [illegible] granted [illegible] was [illegible] found ma- [illegible] career. [illegible] were [illegible] James [illegible] Alexandre [illegible] the [illegible] the comp[illegible] [illegible] as a [illegible] of lithography [illegible] a [illegible] artistic [illegible] are now [illegible] artist [illegible] the artist's [illegible] grown to be [illegible] important branches of the [illegible] denced by the fact that [illegible] alone, according to the [illegible] capital invested was $2[illegible] was [illegible]

M[illegible].— [illegible] lithographic [illegible] is a [illegible] stone [illegible] shades of [illegible] found among [illegible] dark olive grey [illegible] but [illegible] artist [illegible] contras[illegible] the [illegible] as well as on [illegible] stone is quar- [illegible] and [illegible] France [illegible] of the [illegible] thickness, [illegible] [illegible] some

[illegible] been the de[illegible] of lithog- [illegible] since [illegible] place [illegible] has been in use for 50 years or [illegible] it possesses [illegible] extent, it [illegible] the most [illegible] and [illegible] have been [illegible] with the [illegible] artist [illegible] made by [illegible] New [illegible] the [illegible] as a [illegible] Degas [illegible] found [illegible]

The ink [illegible] a pl[illegible] with [illegible] Gum ar[illegible] lithog[illegible] vention [illegible] value [illegible] reinforces the [illegible] the stone. When [illegible] drawing [illegible] its su[illegible] gum [illegible] chemical change [illegible] where [illegible] by the [illegible] or [illegible] of the drawing [illegible] carbon is fr[illegible] a [illegible] form of a fu[illegible] [illegible] the [illegible] set in the [illegible] water, the [illegible] unattackable grease. [illegible] the drawn parts [illegible] dered [illegible] water. By decomposing [illegible] which contains [illegible] soap—one of the c[illegible] ponent parts of [illegible] crayon or ink. [illegible] object of this [illegible] is not to elevate [illegible] drawing—the [illegible] if any is obtained, be[illegible] hardly perceptible, and although it tends [illegible] make the impression cleaner and sharper, [illegible] not absolutely necessary.

Process.—After the stone is etched, it [illegible] washed successively with water and turpenti[illegible] When wiped clean the surface at first g[illegible] [illegible] to be [illegible] blank, but on [illegible] [illegible] shows a [illegible] suggestion of the [illegible] in white on the face of the stone. After [illegible] repeatedly [illegible] and rolled in [illegible] [illegible] ink, the drawing reappears and accepts [illegible] It is then covered with a weak solu- [illegible] of gum arabic and is ready for printing. [illegible] drawing on stone is necessarily reversed and [illegible] requires considerable experience on the part [illegible] artist to obtain proficiency in thus rea[illegible] a reverse facsimile of the original. In [illegible] of an experienced and capable artist [illegible] active art can offer greater possibilities [illegible] of crayon drawing on a grained stone.

To make the transfer ready for printing, it is etched in the same manner as an original drawing. In chromo-lithography the first transfer made is always that of the key-plate, supplied with register marks. The impression from this transfer is mounted on a sheet of aluminum or zinc and coated with shellac to ensure against stretching or shrinking. All succeeding transfers are “stuck-up” or fixed on this key-sheet, in order to enable an accurate register of the colors.

Lithographic Printing.— The lithographic hand-press differs essentially from both the type and copper-plate hand-presses, a scraper being used instead of the vertical pressure of the platen. It consists of a frame provided with rollers on which the bed runs to and fro, the scraper or impression-bar and a tympan of leather, fitted to an iron frame hinged to that end of the bed nearest the scraper. The scraper consists of a flat piece of box-wood, beveled on both sides and covered with leather. The manner of printing is as follows: the stone with the design upon it is placed face up upon the movable bed, then moistened with a sponge, rolled up with ink and the sheet which is to take the impression, laid thereon. Several sheets of paper are placed over it to secure the necessary backing, the tympan lowered upon it to cover the entire bed and stone, and the carriage brought forward under the scraper. Pressure is applied by means of a hand-lever at the side of the press, and the entire length of the bed passed under the impression bar. The pressure is then released, the bed brought back to its original position, the tympan raised and the printed sheet taken off. Until the introduction of the lithographic power-press in 1867, this method of printing was exclusively used for lithographic printing. At the present time its only utility is for the purpose of making artist-proofs and transfers for printing on power-presses. The lithographic power-press differs but slightly from that of the typographic power-press. The principle of operation remains the same, taking in place of the letter-press form a lithographic stone in its bed and being supplied with a contrivance for distributing the moisture with which the stone must be covered before the ink is applied. The use of rotary printing-presses, with an increased speed of 50 per cent over the flat-bed presses, has been made possible by the substitution of the flexible aluminum plate for lithographic stone, and has opened the field of multi-color printing by the lithographic process, whereby two or more colors are printed in rapid succession before the sheet is delivered. The rotary press consists principally of two cylinders — one to hold the plate and the other to furnish the pressure — and is supplied with a mechanism similar to that of the flat-bed press for distribution of moisture and ink. Rotary presses having two and three plate cylinders and printing respectively two and three colors each time a sheet is fed are already largely in use, and four-color presses are now being built on the same general principle.

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Otto W. Wilhelms,
Of Sackett & Wilhelms Lithographing and Printing Company, New York.

Lithot'omy, in surgery, the operation of cutting for the stone. (See Calculus.) As usually performed it consists in cutting by the side of the anus in the perinæum, so as to reach and divide the urethra and neck of the bladder, where it is surrounded by the prostate gland. A grooved and curved staff is introduced into the bladder first, and then the incision is made in the perinæum to reach the bladder, the groove in the staff serving as a guide to the knife. When the calculus or stone is felt with the finger the staff is withdrawn and the stone extracted by means of forceps, proper treatment to ward off inflammation and other accidents being then adopted. When thus performed, unless there be unusual difficulties, the length of time required to extract the stone is seldom more than three minutes, often one or one and a half. At first the urine escapes through the wound, but in favorable cases it issues by the natural passage within a week, and the wound heals in the course of a month.

Lith'otrity, in surgery, the operation of crushing a stone in the bladder into fragments of such a size that they may be expelled by the urethra. The instrument, called a lithotrite, by which the stone is broken up, is introduced in the same manner as a catheter or sound into the bladder, and after catching the stone crushes it to pieces. The instrument has two movable blades at the extremity introduced into the bladder, and these are brought together to crush the stone by means of a powerful screw. This operation is only applicable where the bladder is not irritable, where the canal of the urethra is of good size, and the stone small. It is inapplicable to children, but this is the less to be regretted, because there is perhaps no surgical operation more generally successful than that of lithotomy in children. In lithotrity care must be taken that no portions of the stone are left in the bladder, as such fragments are almost certain to form the nuclei of fresh concretions.

Lithuania, lĭth-ū'ā-nĭ-ạ, Russia, a historic grand-duchy of 60,000 square miles, united in 1569 to Poland, and since the dismemberment of that kingdom in 1773, 1793, and 1795, forming the Russian governments of Mohilev, Vitepsk, Minsk, Vilna, and Grodno, and portions of the Prussian province of Gumbinnen and East Prussia. The Lithuanians, who are of Lettish origin (see Livonia), were in the 11th century tributary to Russia, but they made themselves independent when Russia was divided by the troubles under the successors of Vladimir. Ringold, in 1235, bore the title of grand-duke, and under his successors the whole of Russian Lithuania became independent. Vladislaus Jagello, by his marriage with the Polish queen Hedwig, united Lithuania and the conquered Russian provinces with Poland.

Lititz, lĭt'ĭts, Pa., borough, in Lancaster County; on the Reading & Columbia railroad;

Canal, and on the West Shore and the New York Central & H. R. R.R.'s; just midway between Albany and Syracuse. Where the city is now was once the site of an Indian village, and was visited in the 17th century by missionaries. A white settlement was made here about 1770 or a few years later. In 1782 this settlement was destroyed by Indians and Tories, and no successful efforts were made to rebuild until 1790, when a colony of Germans took possession. The place was incorporated as a village in 1811; the incorporation was changed in 1827. It became a city in 1895. The city gets its name from the falls, or series of cascades in the river, which descends 45 feet in less than a mile. General Herkimer, a Revolutionary officer, is buried in a cemetery near the city.

Little Falls is situated in a grazing region noted for its dairy products; but the city is noted for its manufactories. The country around is rolling and is diversified by many low hills; but along the Mohawk, where Little Falls stands and in the vicinity, there are peculiar rock formations. The chief manufactures are knit-goods, paper, carriages, bicycles, leather, knitting machinery, foundry and creamery products, and book-cases. There are about 2,500 employees in the manufacturing establishments. The two banks have a combined capital of $350,000; the annual amount of business is about $2,750,000. The city has a number of fine church buildings, a city hospital, a public school library, an excellent high school, public and parish schools, and a number of fine public and private buildings. Pop. (1890) 8,783; (1900) 10,381.

Little Giant, The, a familiar name applied to Stephen A. Douglas (q.v.) by his political admirers in allusion to his small stature and great intellectual capacity.

Little John, one of the outlaw comrades of Robin Hood. He was famed for his strength and was the only one of the company who could approach Robin Hood in skilful handling of the bow. By some authorities his name is supposed to have been John Nailor.

Little Kanawha, kă-nâ'wạ, a river which has its rise in the central part of West Virginia, flows west and northwest, and enters the Ohio River at Parkersburg. It is about 100 miles long, has considerable rapidity in the mountain section, and is of benefit as a route for the transportation of the oil and lumber of that portion of the States through which the river flows. It has been made navigable as far as Burning Springs, about 40 miles from Parkersburg.

Little Lord Fauntleroy, a popular story for children by Mrs. Frances Hodgson Burnett, originally published in 1885 as a serial in the magazine ‹Saint Nicholas.›

Little Mac, a nickname applied by the soldiers of the Union army during the Civil War to General George B. McClellan (q.v.).

Little Nell, a child character in the novel ‹Old Curiosity Shop,› by Charles Dickens. She was reared amid vice and crime, yet preserved a beautiful purity of character.

Little Phil, a nickname given by his soldiers to General Philip H. Sheridan (q.v.) during the Civil War.

Little Red Riding Hood, a well-known fairy tale which first appeared in Paris in 1697, in a collection of tales by Charles Perrault.

Little Rock, Ark., capital of the State, the seat of Pulaski County, and the largest city in the State; on the St. Louis, I. M. & S., the Rock Island, and the St. Louis S. railway systems; 133 miles west of Memphis, 346 miles southwest of St. Louis, 165 miles west of Fort Smith, and 145 miles northwest of Texarkana. Little Rock is situated on both banks of the Arkansas River, and takes its name from the rocky promontory which rises on the south bank some 50 feet above the river, now used as one of the abutments of one of the four bridges which span the river. This rock is the first seen in ascending the river, and was called the Little Rock, in contradistinction to the bold precipice, about ten times higher, which rises some three miles above upon the opposite bank, and called the Big Rock. This commanding eminence is now the site of an army post. While the eastern border of the city touches rich alluvial cotton lands, without rocks and subject to a high state of cultivation, its western border reaches to the foothills of the Ozark Mountains. It is situated near lat. 35° and lon. 92°, almost at the centre of the State. The Arkansas River is navigable up to this point during the major portion of the year for large steamboats, while smaller vessels ply as far up as Fort Smith.

Trade and Commerce.—The growth of the commerce of Little Rock has been gradual but steady. The total business for 1902 is estimated at $50,000,000, a large portion of which consisted of cotton and its by-products. During the season of 1901–2 Little Rock shipped 246,675 bales of cotton. The total freight traffic for 1902 employed 83,405 cars. The real estate transactions during the same year aggregated $2,495,882. The postal receipts for the fiscal year ending 30 June 1903, totaled $116,036. The Board of Trade, the Retail Grocers' Association, and the Merchants' Freight Bureau are organs for concert of action among business men.

Manufactures.—The largest single industry is the manufacture of cottonseed-oil. There are four mills, which shipped during the season of 1901–2, 727 cars of oil, 1858 cars of meal, and 473 cars of hulls. Of other industries, besides domestic and jobbing shops such as clothing, food, plumbing, etc., the principal are foundries, railway shops, a cotton mill, ice and printing plants, 4 compress companies, beer and bottling works, and wagon shops. The census report shows that in 1900 the city contained 171 manufacturing establishments with $3,434,393 capital, employing 2,751 persons, paying $1,384,722 in wages, and $1,990,081 for materials, and having a total output of $4,723,118.

Banks.—On 1 Nov. 1903, there were three national banks and 12 State and savings banks, with a capital stock of $1,875,000 and surplus of $563,410, and deposits amounting to $6,211,117. The local bank clearings for the year 1902 aggregated $48,521,981.99. Besides these, there are 13 building and loan associations, all local, with aggregate stock amounting to $8,335,010, and loans in force aggegating $2,605,316.

Government and Finances.—All municipal corporations in Arkansas are governed by general laws, and not by special charter. The mayor, treasurer, police judge, city clerk, and

2,600 were entitled to attend the public schools in that district. Besides the public schools, there are private and parochial schools. For higher education, the University of Arkansas, the main departments and buildings of which are located at Fayetteville, has branch schools of law and medicine located here. Besides these are the Arkansas Military Academy, a military training school for boys, Maddox Seminary for young ladies, and the Philander Smith College for colored youth.

History.—When the territory now known as Arkansas passed to the United States in 1803, the site of the future capital was an unbroken wilderness. By the act of Congress of 2 March 1819, the seat of government of the newly created territory was fixed at the Post of Arkansas on the Arkansas River some 30 miles above its confluence with the Mississippi. On 24 Oct. 1820, an act was passed removing the capital to Little Rock. It has been aptly said that so manifest was the destiny of the future city that it was made the seat of government before it had become a town. A post-office was established on 10 April 1820. It was incorporated as a town 27 Oct. 1825. It is said that the inhabitants numbered only 450 in 1830. On 2 Nov. 1835, it was, by special act, incorporated as a city. When the momentous question of secession arose in 1861, a convention was called by the legislature to meet at Little Rock to discuss the subject. It met on 4 March, and, after considering the matter, adjourned without definite action on 21 March, subject to recall. On 6 May 1861, when war was already flagrant, the convention, being recalled, with only one dissenting vote, adopted an ordinance dissolving the union existing between the State of Arkansas and those united with her under the compact entitled, «The Constitution of the United States of America.» On 10 Sept. 1863, Little Rock was captured by the Northern army under Gen. Steele, and remained in possession of the Federal forces during the remainder of the war. The unexpected increase in the population between the years 1860 and 1870, covering the period of the Civil War, may perhaps be attributed to the fact that during that period of disintegration society was forming new associations. The growth of the city since 1880 has been constant and rapid.

Newspapers.—The city has three daily and several weekly newspapers. The Arkansas *Gazette* was originally founded by Wm. E. Woodruff, Sr., at the Post of Arkansas in 1819, and has been continuously published ever since under the same name, except when it was suspended for a short time during the war. When the seat of government was removed to Little Rock in 1820, it followed in the wake of the government, and issued its first number at the new capital on 29 Dec. 1821. Its subsequent growth has been closely linked with that of the city.

Population.—The population of Little Rock in 1850 was 2,167; (1860) 3,727; (1870) 12,380; (1880) 13,138; (1890) 25,874; (1900) 38,307, of whom 23,590 were white, and 14,717 were colored. Of these 38,307 inhabitants, 2,099 were foreign born, while 36,307 were native. In 1904, population was 55,000. T. D. Crawford,

Supreme Court Reporter, Little Rock, Ark.

Little Rock, Capture of. The State authorities of Arkansas seized the United States arsenal at Little Rock 8 Feb. 1861, and until 10 Sept. 1863 the city remained in Confederate occupation. After the fall of Vicksburg and Port Hudson, 4 and 8 July 1863, Gen. F. Steele was ordered from Vicksburg to Helena and directed to form a junction with Gen. Davidson, who was moving south from Pilot Knob, Mo., break up Sterling Price's army, and occupy Little Rock. Steele arrived at Helena 31 July and organized his expedition, finding at that place two divisions of infantry, a brigade of cavalry, and 39 guns; in all, about 7,000 men. On 5 August he marched for Devall's Bluff on White River, reached it without incident, and there was joined by Davidson with 6,000 cavalry and three batteries, making his force about 13,000 men and 57 guns. A few days later he was joined by a brigade which raised his aggregate to over 14,000, of whom 10,500 were effective, many being sick. August 24 Davidson's cavalry advance skirmished with Marmaduke's cavalry up to and through Brownsville and up to his intrenchments at Bayou Meto. Davidson fell back to Brownsville, where, 2 September, Steele joined him, and concentrated all his available force. The position on the Bayou Meto, 12 miles from Little Rock, was flanked, and on the 7th Steele reached the Arkansas River near Ashley's Mills, where Davidson's cavalry had a sharp skirmish and drove the Confederates across the river. Steele repaired the main road back to Bayou Meto, and on the 10th Davidson crossed to the south side of the river by a pontoon bridge and marched on Little Rock, but ten miles distant, Steele marching along the north bank. The city was defended by Sterling Price with about 7,700 men, of whom 6,500 were intrenched on the north side of the Arkansas, and about 1,200 on the south side, on the line of the Bayou Fourche, about five miles from the city. Davidson moved directly on the city, without much opposition until he reached Bayou Fourche, where he found Marmaduke's cavalry, dismounted, a brigade of infantry, and two batteries, all drawn up to oppose him. Davidson attacked on two roads, driving the Confederates back; Steele, who had marched abreast of him on the opposite side of the river, opened an enfilading artillery fire; and Marmaduke fell back through the city, closely followed by Davidson's cavalry. Price had withdrawn from the north bank of the river when he learned that Davidson had turned the position, and evacuated the city at 5 P.M., retreating to Arkadelphia. Steele's cavalry followed Marmaduke's cavalry for a day, and returned to Little Rock on the 12th. At 7 P.M. the city was formally surrendered to Davidson by the civil authorities. Price burned eight steamers, one of them a powerful gunboat, but the arsenal was saved. Steele reported a loss of 137 killed, wounded, and missing; Price reported a total loss of 64. Consult: ‹Official Records,› Vol. XXII.; Lossing, ‹History of the Civil War,› Vol. II.; The Century Company's ‹Battles and Leaders of the Civil War,› Vol. III.

E. A. Carman.

Little Turtle, an Indian chief of the Miami Nation, one of those who signed the Treaty of Greenville in 1795. He visited President Washington in Philadelphia in 1797. He a very extensive circulation. By far the most popular of all is his 'Die Wunder des Himmels,' of which the 8th edition was published (1895-7). It ranks as one of the best works of astronomy for the use of general readers.

Littrow, Karl von, Austrian astronomer: b. Kasan, Russia, 18 July 1811; d. Venice 16 Nov 1877. He was a son of Johann Littrow (q.v.), whom he assisted in the Vienna Observatory from 1831, and succeeding him as director in 1842. He edited the works of his father, adding considerably to 'Die Wunder des Himmels,' and was the author of 'Populäre Geometrie' (1839); 'Verzeichnis der geographischen Ortsbestimmungen' (1844-6).

Liturgy (Greek λειτουργία means a public service; used at Athens to mean a public service which the richer citizens discharged at their own expense). The Septuagint translators used the Greek word *leitourgos* for that service of God in the Sanctuary. In the Hebrew it had various kindred meanings; in the Old Testament it usually denotes the service of a Jewish priest, but in the New Testament it is used of any service rendered to God. In the 4th century, the word as applied to priestly ministrations was generally recognized; and while it continued in use as meaning any solemn service, it was applied especially to the Eucharistic service. It is in this sense that the word is used by the Greek Church when they say «Divine liturgy.»

The records extant which show the exact liturgy of the Christian Church in the 1st century are more the allusions found in documents of the 2d century. From the year 150 there are numerous proofs to show the existence of a fixed order and fixed words for the service of the mass or for the Eucharistic service. This service or liturgy was not made just when mentioned by Cyprian, and in 138 by Justin, and many others who committed to writing the order of the services or the liturgy. But there is not sufficient proof to warrant the assertion that there was any entire written liturgy before the 4th century. As the liturgies exist to-day they may be divided into five groups or families of liturgies, distinguished from each other chiefly, though not entirely, by the different arrangement of their parts. Three of the groups are Oriental and two are Western. They are: (1) The West Syrian Group, which includes the Liturgies of Saint James, Saint Basil, Saint Chrysostom, and that of Armenia. In this group the intercession for the living and the dead is placed after the invocation of the Holy Spirit, which in Oriental liturgies follows the consecration.

(2) The Alexandrian Group, which includes three Greek liturgies; Saint Mark, Saint Basil, and Saint Gregory, also the Coptic liturgies. This group is characterized by the «Great Intercession» for the living and the dead being placed in the midst of the Preface.

(3) The East Syrian Group includes the liturgies in the Syriac language as used by those who belong to the Roman Catholic Church. In this group the «general intercession» is placed between the words of institution and the invocation of the Holy Spirit.

(4) The Liturgies of Gaul and Spain. In this group the «Great Intercession» comes just after the offertory, though the Mozarabic liturgy has a memento of the living before the Pater Noster.

(5) Gallican Liturgy. In this the intercession is divided, that of the living is before consecration, and that of the dead after consecration.

That part of the «Liturgy of the Mass» called the «Canon» is very ancient, and existed about as at present since the time of the Apostles (see Mass; Missal). The liturgy of the Church of England is derived from the Ephesine original through the ancient Gallican liturgy which was brought to France by Greek missionaries, who were accustomed to use the form known as the liturgy of Saint John. There is no invocation of the Holy Spirit in the present English form, although the Protestant Episcopal Church has restored the invocation, like the Scottish Episcopal Church. There is, however, no ritual element wanting in these two English forms whether they be compared with the Greek or Latin liturgies. The liturgy in use in the Protestant Episcopal Church more nearly resembles the Gallican liturgy than any other group, but in some respects there is a difference in arrangement, and also in meaning. There is no intercession for the dead, and the intercession for the living comes before the Communion.

Bibliography.—Tertullian, 'De Corona'; Cyprian, 'Epistle'; Report of Council in Trullo; Probst, 'Liturgie der drei ersten Jahrhunderte,' who claims that there was a written liturgy before 150; Hammond, 'Ancient Liturgies'; Smith and Cheetum, 'Liturgies'; Rock, 'The Church of Our Fathers, as Seen in Saint Osmond's Rite for the Cathedral of Salisbury' (1904); De Herdt, 'Sacra Liturgia' (3 vols.).

Lit'uus, (1) a crooked staff, represented in works of art as borne by the ancient Roman augurs in their divinations. It was like a crozier in shape. (2) A trumpet, having a mouth which curved upward, and which was used by the Roman priests and cavalry. (3) In geometry, a spiral, of which the characteristic property is that the square of any two radii vectores are reciprocally proportional to the angles which they respectively make with a certain line given in position, and which is an asymptote to the spiral.

Liudger, lĭ-ood'ger, **Saint,** the first bishop of Münster, Germany: b. Friesland about 744; d. Billerbeck 26 March 809. He studied in England under Alcuin, and returned to preach Christianity to his countrymen. When Witekind was sent to Friesland in 784, Liudger abandoned his mission and went to Rome. Subsequently he returned to become the first bishop of Münster. The various *Vitæ S. Liudigeri* are collected in the 'Geschichtsquellen des Bistums Münster' (Diekamp 1881). Consult also the Lives by Hüsing (1878); Pingsmann (1879); and Krimphove (1886).

Liudprand, lĭ-ood'prănd, **Liutprand,** or **Liuzo,** Italian historian: b. about 922; d. 972. He was of a noble Lombard lineage. His father, who was King Hugo's ambassador to Constantinople, dying when the son was not more than five years old, young Liudprand was educated as a page in King Hugo's court in Pavia, and later entered the Church. Hugo's successor, Berengarius, made him chancellor, and in 949 sent him on an important diplomatic mission to Congium and Germany fell as low as six cents per pound, many thousands of inferior animals, unemployed and disabled horses, found their way to fertilizer factories. These factories buy cast-off horses as low as $2 per head; the hide is worth, on an average, $3.25, the bones $1.25, the fat and tankage about as much more; and with the resultant fertilizer yields handsome profits. The result of the wholesale destruction and diminution of these inferior animals has been a rapid improvement, still progressing, in the quality of the American horse. See various articles under title HORSE for information regarding that animal.

In the west and south the mule, as a draft and farm animal, has long been of great service. Gen. Washington was America's first successful breeder of mules. The king of Spain presented Washington with a jack from his royal stud in 1787. Gen. Lafayette also presented him with one, which sired Washington's favorite jack, Compound. To him he bred his best coach mares, and produced such valuable animals that the southern planters began to use their thoroughbred mares for raising mules. The mule being more steady at a draft, less liable to injury or disease, less subject to lameness, and being able to endue heat and hardship better than the horse, his price for heavy work has kept as high as that of draft horses. The number of mules in the United States increased from 559,331 in 1850 to 3,438,523 in 1900. There is no import trade in mules, the trade being wholly domestic and export. From 1,965, valued at $238,591 exported in 1891, the number in 1900 had increased to 50,179 valued at $4,757,892.

The large exports of horses and mules in 1900–1901 was in great part due to the demand for war purposes in South Africa. In 1902 the export of horses was 60,694, value $6,086,012; of mules, 16,306, value $1,744,192.

In American cattle, not only good health but good blood is remarkable; the immense herds have been singularly free from the diseases which from time to time have swept off the cattle of middle and southern Europe. Pleuro-pneumonia and anthrax entered our shores with imported cattle from lands where such diseases have a hold, but these plagues spread over no great extent of country. Under the efficient organization of the U. S. Bureau of Animal Industry, outbreaks of any contagion speedily disappeared; and every cargo of cattle leaving our ports carries with it a clean bill of health. Fresh importations are continually being made, and in our herds is the blood of the choicest of the Devon, the shorthorn, the longhorn, the Hereford, the Sussex, and the Norfolk of England; the Ayrshires, Angus, and Galloway of Scotland; the Kerrys of Ireland; the Alderney, Guernsey, and Jersey of the Channel Islands, and the Holstein from Holland.

The first English colonial settlement on the James River, brought cattle from England as early as 1607. Succeeding colonies brought cattle from the countries whence they emigrated. In 1625 the settlers of New York made an importation from Holland, which was followed by further importations, each leaving its impress on the cattle of that region. The English colonies in Massachusetts and New Hampshire, the Dutch in New Jersey, the Swedes in Delaware, and the Danes on the Piscataqua River, all brought cattle from the countries nearest the ports from which they sailed. The cattle of Normandy came in with the French around Quebec, and the Spanish cattle from South America and Mexico made their impress on the Southwest, as seen in what are now called Texas cattle. The shorthorns have been more used, perhaps, than any other beef breed for improvement of stock; and the early settlers were more interested in developing cattle that could concentrate the wealth of grass and corn of the fertile valleys into beef than into butter and cheese.

Soon after the Revolutionary War a few shorthorn cattle had been imported into Virginia. They were well fleshed, and the cows gave as much as 32 quarts of milk a day. In 1783, Matthew Patton, Sr., of the South Fork of the Potomac, imported a longhorn bull. In 1785 three of Patton's sons moved to Kentucky, taking with them some of the half-bred heifers. In 1795 they sent back to Virginia and Maryland for cattle known as «milk cattle.» In 1803 the Pattons brought out the «milk bull» Pluto 825, a noted breeder. Descendants of this bull and another named Mars, and a cow, Venus, found their way into the Virginia Reservation of Ohio, and laid the foundation for future improvement of cattle in the West. In 1817, Lewis Sanders, of Lexington, Ky., imported three bulls and three heifers from England, which were of so good a quality that they laid the foundation of many excellent herds. In 1818, Cornelius Coolidge, of Boston, Mass., imported a heifer and a bull. About 1820 several public-spirited men in the neighborhood of Boston brought out at different times a number of valuable animals, whose descendants are still numerous in New England. In 1823, General Stephen Van Rensselaer, of Albany, N. Y., imported the bull Washington and two heifers. In 1824, Colonel John Hare Powell, of Philadelphia, began to import shorthorns, and bred largely at his estate near the city, selling them to go into Ohio and Kentucky. The first drove of fat cattle from the fertile Scioto country and the Virginia Reservation crossed the Alleghanies in the spring of 1805. Of the 68 head, 22 were disposed of at Morefield, Va. The remainder were driven on to Baltimore where they were sold at a net profit of $31.77 per head. The problem of getting cattle from the grazing lands of the West to the Eastern markets was solved, and its effects were as great as those of the successful shipment later of the first cargo of fat cattle to England, or the first efforts of Swift & Company, in sending dressed beef from Chicago to New England. The Virginians of Ohio and Kentucky co-operated in the exchange and improvement of their best cattle. Not content with the slow improvement of cattle, various Ohio breeders under the lead of ex-Governor Duncan McArthur, Felix Renick, George Renick, William Renick, and S. S. Denney, resolved «to try the experiment of direct importation from Great Britain,» and formed a company 2 November 1833, with ample capital and unlimited public spirit, as no subscriber expected any profit on the money invested. Mr. Felix Renick, E. J. Harness, and Josiah Renick were sent to England to buy the best cattle they could find, regardless of price. Their first importation consisted of seven bulls and twelve cows and heifers. Further importations followed. In 1835 and 1836 Felix Renick had

50,000 head were exported to Great Britain, Cuba, the British West Indies, Canada, and Mexico. More than half of this number went to Cuba, and only 5,091 to Great Britain. The quality of cattle having improved, the export trade to Great Britain in 18 years increased to 355,852, worth nearly $32,500,000. France, Germany, Belgium, and the Netherlands, took less than $2,000,000. From 394,772 heads of cattle valued at $36,576,412 exported in 1896, the number increased in 1901 to 454,590 heads, valued at $36,606,204. In 1902, 327,118 heads of cattle, valued at $24,301,969, were exported. 93,481 cattle were imported, 2,119 being high class stock for breeding purposes, and the remainder 91,362 «feeders,» a cheap grade of animal, brought in from Mexico and Canada to be fattened for market. In 1877 the first shipments of fresh beef in refrigerator-ships were made. In 1870 the value of all shipments of beeves and beef products was $6,194,626. In 1902 the total value was $62,420,732, taking more than 1,000,000 of the choicest cattle from the central corn-growing States. In 1870 an export beef was worth $15.98; in 1891 the average price was $81.26 each, showing that as quality improves price advances, although in 1901 it had fallen to an average price of $74.30. There is no longer any demand for good cattle among country butchers, and the farmer who formerly could fatten one to six prime bullocks has now no market.

The hog crop of America is most closely related to the corn crop. The States in the corn belt west of the Ohio River furnish the surplus pork for export and for home consumption in States where corn is not largely grown. Hogs were brought by the Virginia and Massachusetts settlers, and in the common hog of the country was early found a mixture of types and races from every country where pork was produced. This mongrel was the base, easily impressed by the blood of the China, Neapolitan, Berkshire, Tamworth, and other breeds, known as early as the second quarter of the century. After the settlement of Ohio and Kentucky improvement was marked. The corn in the valleys and the mast in the timber furnished food in such abundance that the energies of the early settlers were bent upon producing pork and cattle to utilize the superabundance. The West Indies furnished a market for all surplus pork of the Eastern States, and under the stimulus of this trade fat hogs were produced along the Delaware, before the development of the interest in the country around Cincinnati. The production of hogs in Ohio, Kentucky, and eastern Indiana increased so rapidly that Cincinnati early became the packing centre of the West. As the Wabash, the Illinois, and the Missouri valleys and the prairies became vast corn-fields, and the railroad pushed westward, the centre of pork production also moved west. Ohio is no longer the leading corn and hog State, being now the seventh; and Cincinnati is excelled as a packing city by Chicago, Kansas City, Omaha, St. Louis, and Indianapolis. The China and Berkshire, along with the Russian and Irish grazer, were earliest used to cross upon the common hog. In New Jersey the red hog formed the foundation for the large hogs to furnish the heavy meat for the West Indies and the Carolinas. In Chester County, Pennsylvania, the white hog was the favorite, and the type called Chester white was established. In the Miami Valley the China, Berkshire, Woburn, Russian, and Irish grazer blood mingled with that of the common hog, and the Poland China breed was evolved and improved to meet the wants of the packer and feeder. In northern Ohio, in the dairy districts, where the conditions of feed, soil, and handling were very different, the white hog of Pennsylvania has been improved, and we find a breed known as Todd's improved Chester whites. The red hog of New Jersey has come west, filled out, and is taking on the plumpness and refinement of bone, ear, and head peculiar to the breeds in a corn-growing country. In northern Indiana we find a breed of white hogs called Victorias, finer in type than the Chester whites, and of more growth than the small English breeds. The above-named American breeds have become so well fixed and established that each has its record. The improvement of the swine of America has been greater than that of its horses, cattle, or sheep, and with a far smaller outlay for imported animals for breeding purposes. The cotton States consume more pork than they produce, and the States producing the surplus are Iowa, Illinois, Ohio, Missouri, Indiana, Kansas, Nebraska, Wisconsin, Tennessee, Kentucky, Minnesota, and Michigan, ranking about in the order named. It has been estimated that 95 per cent of the exports of pork, 86 per cent of the exports of lard, and 93 per cent of the total exports of hog products from the United States come from the surplus of these States.

While the sheep industry is of variable importance, there are according to recent returns about 40,000,000 sheep in the United States, exclusive of lambs under one year of age. The chief sheep raising States are Montana, New Mexico, Wyoming, Ohio and Utah. The imports of sheep in 1902 were 304,755, valued at $1,049,231; the exports 235,497, valued at $1,492,484.

Our unequaled system of transportation is one of the prominent factors which helped the remarkable development of the pork business. Pork products are carried from Chicago or St. Louis to New York for only about one third of a cent per pound. The ocean charge from New York to Bremen is about the same. Direct consignments from St. Louis or Chicago to Bremen have been shipped for a little more than half a cent per pound. Lard production has suffered somewhat since the discovery of the process of utilizing a waste product of cotton. Cotton-seed oil has now come into such extensive use as a substitute for lard and lard-oil, for culinary and manufacturing purposes, that its present annual sale is estimated to exceed the equivalent of 70,000,000 pounds of lard. The production of oleo from beef suet has also furnished the by-product of stearine, which enters largely into the manufacture of lard substitutes, to give body and consistency to imitation lard. This adulteration of lard has brought American lard into disrepute in foreign markets, and reduced the demand. The surplus of pure lard continues great, and its extent fixes the price. The healthfulness of American pork, like that of our beef, has been a distinguishing entrance into and emergence from the organ of the blood-vessels, nerves, and hepatic ducts.

The liver is held in place by five ligaments, four of which are simple folds of peritoneum, while the fifth, or ligamentum teres, is a round cord formed by the obliteration of the umbilical vein and extending from the anterior edge of the liver at the notch between the left and right lobes to the umbilicus and along the under surface of the liver to its posterior border. The peritoneal folds which serve the purpose of ligaments are a longitudinal one extending on the upper surface of the organ from the notch in front to the posterior border, a coronary ligament which is found along the posterior border, and a right and a left lateral ligament. These peritoneal reflexions serve to hold the organ in place, keeping it more or less firmly in apposition with the diaphragm.

The blood-vessels entering the liver are the hepatic artery and the portal vein; the former being a branch of the cœliac axis, the latter being the large venous trunk which is formed by the union of the superior mesenteric and splenic veins. Both the hepatic artery and portal vein divide in the transverse fissure into two parts, a right and a left, which enter the substance of the right and left lobes respectively.

The hepatic veins are the efferent veins of the liver conveying the blood from this organ into the inferior vena cava. In addition to these vessels, the liver, like other organs, is supplied with large and numerous lymphatics. The nervous supply of the organ is derived from the left pneumogastric, the hepatic plexus of the sympathetics, and from the right phrenic nerve. The bile ducts and hepatic ducts will be described below.

The gall-bladder is a small pear-shaped sac lying on the under surface of the liver. At its narrow end it opens into a small duct (cystic duct) which passes back and down to join the hepatic duct forming the common bile duct, which terminates in the duodenum. The gall-bladder is the reserve sac in which bile is stored and by the contracting of which a uniform flow of this liquid is maintained.

Structure of the Hepatic Substance.— The substance of the liver is made up of lobules of more or less equal size, separated by areolar connective tissue, which is a continuation of the fibrous covering of the organ or *capsule of Glisson.* In these fibrous septa between the lobules are found the larger blood-vessels, biliary ducts, lymphatics, and nerves. The lobule under a low power of the microscope is seen to be composed of radiating columns of liver cells converging to a central point in which is situated a large vein (intra-lobular vein) belonging to the system of the inferior vena cava. The columns of liver cells branch and anastomose with each other, and between them are spaces occupied by blood capillaries and the primary biliary passages. The liver cells themselves are polyhedral in shape, and are so arranged that a capillary space, known as the biliary capillary, is left between them. The capillary blood-vessels are similarly formed by the peculiar juxtaposition of the liver cells, leaving spaces in which the capillary blood-vessels extend from the terminal branches of the portal vein in the septa at the periphery of the lobules to the central vein already mentioned. The latter, collecting the blood from the capillary system, transports it to larger vessels known as sublobular veins, which finally unite and form the hepatic veins and discharge the blood into the inferior vena cava. The hepatic arteries and their terminal branches occupy the septa and supply blood to the connective tissue constituting the septa, and to the walls of the portal veins and biliary ducts. The venous blood of this distribution is discharged into the terminals of the portal vein within the septa.

At the periphery of the hepatic lobules, the epithelial cells of the hepatic columns continue directly into the smaller bile ducts which are situated in the interlobular septa. These primary bile ducts unite to form larger ducts and finally a right and left hepatic duct emerging from the transverse fissure unite to form a common bile duct. This is further joined by the *cystic duct* or duct of the gall-bladder, and it terminates in the duodenum in a common orifice with the pancreatic duct.

The structure of the liver is such that the blood entering through the portal circulation comes in contact with the liver cells on one side while the capillary biliary passages are on the other side of the hepatic cell.

The lymphatic vessels accompany the portal vein and hepatic artery, and another system accompanies the branches of the hepatic vein. The capillaries penetrate into the lobules, passing between the hepatic cells.

Functions of the Liver.—The physiological functions of the liver are probably very numerous and are but imperfectly understood. The position of the organ indicates that one of its important functions is the elaboration of materials presented by the blood coming from the gastro-intestinal tract, and probably also the purification of this blood. As far as they are known, the functions of the organ may be divided into the *metabolic* and *biliary.*

Metabolic Functions.— It is known that the liver acts upon sugars and other carbohydrate materials to convert them into glycogen which is stored up by the hepatic cells. This accumulates during digestion and is utilized in the intervals, so that the percentage of sugar in the blood is kept at an approximately uniform standard. It is known that in certain diseases (for example, diabetes), this function is greatly disturbed with resulting consequences that affect the general health. The liver shares with the muscles of the body this glycogenic function.

Another important metabolic function is that of forming urea, the final stage in the metabolism of albuminous food. Uric acid also is to some extent formed in the liver but is more particularly the product of the lymphatic organs and tissues.

Biliary Function.— The formation of bile is one of the important attributes of the liver, though possibly this function is less predominating than has hitherto been believed. The bile is an albuminous liquid containing bile pigments (bilirubin, biliverdin), bile salts (glycocholate and taurocholate of soda), nucleo-albumin, cholesterin, fat, and other less important substances including various salts. The bile is secreted more or less intermittently, the amount being greatest about the middle part of the day and increasing after meals. The daily output is from one to two pints. Its functions are numerous. Among other properties it aids in the absorption of fatty foods, stimulates intestinal peristalsis, and prevents intestinal fermentation, *Symptoms.*—After a period of indefinite digestive disturbances, acute jaundice, and marked nervous symptoms set in. The patient becomes deeply jaundiced, delirious, and sometimes comatose. In the course of ten days or two weeks the disease terminates fatally in a large percentage of cases. A small proportion of the cases recover. The treatment consists in stimulation or other measures called for by the general condition.

Fatty Liver.—There are two varieties of fatty disease of the liver, that known as ***infiltration*** and that termed *fatty degeneration*. In the former there is a deposition of fat in the liver cells, similar to that which is found in the subcutaneous tissues in ordinary obesity. In the latter the liver cells undergo destruction with formation of fat. Fatty infiltration may be the result of excessive supply of nutriment as in ordinary obesity, and is also found in certain states of general weakness and wasting, particularly in association with diseases of the lungs. In the latter cases, the cause is to be found in the deficient consumption of fat, owing to diminished oxygenation. Fatty degeneration may be caused by various infectious diseases, but is more particularly the result of poisoning with phosphorus, arsenic, mercury, and other poisons.

In fatty infiltration, the liver is enlarged, lighter than the normal organ in specific gravity and in color, and on section with a knife the increased fat is indicated by an oily character of the cut surface. In fatty degeneration the liver is usually diminished in size and the substance is of a friable softened character.

There are no characteristic symptoms of fatty infiltration, but the increased size of the organ may cause a local feeling of fulness and pressure, and vague disturbances of the general health may also be attributable to the condition. In fatty degeneration, the symptoms are equally obscure. That due to phosphorous poisoning may present itself with the symptoms of acute yellow atrophy (*vide supra*).

Cirrhosis of the Liver is the most frequent and important of the diseases of this organ. It is essentially a replacement of normal liver tissue by connective tissue, causing more or less hardening.

The causes of cirrhosis of the liver are numerous, though one in particular occupies a very prominent position on account of its frequency. The cause referred to is over-indulgence in alcohol, especially raw spirits, whence the terms alcoholic liver, gin drinker's liver, etc. It must not be supposed, however, that alcohol is the invariable cause. Over-eating, gouty conditions, syphilis, and various other infectious diseases may be followed by cirrhosis entirely like that caused by alcohol. It has been noted in the description of congestion of the liver that a form of cirrhosis (cyanotic induration) results from long standing congestion. Sometimes cirrhosis of a peculiar type is caused by obstruction of the biliary ducts. This produces a stagnation of the bile and an irritation of the substance of the liver that terminates in the formation of connective tissue.

Pathological Anatomy.—Two forms of cirrhosis of the liver are recognized. One, known as the ***atrophic***, in which the liver is decreased in size; the other, ***hypertrophic***, in which the organ is increased in size. In atrophic cirrhosis (hobnail liver, granular liver), the organ has an irregular nodulated or granulated surface, the irregularities being caused by the contractions of the connective tissue which forms the basis of this pathological state of the organ. The liver is decreased in size, though not always very notably. It is very firm, and on section the increased connective tissue can be recognized in the form of more or less distinct septa interlacing the lobules or groups of lobules of the liver substance. The lobules and groups of lobules are compressed by the contracting connective tissue, and as a result undergo atrophy and degenerative change. The connective tissue formation which is characteristic of this form of cirrhosis is found in the interlobular tissues surrounding the terminal branches of the portal vein. Consequently the portal circulation is obstructed, and congestion of the various abdominal organs whose blood is discharged through this circulation results. When cirrhosis has proceeded for some time, new channels of circulation may be established, by which the congestion of the abdominal organs is relieved. There results from this visible enlargement of the veins of the abdominal walls and increased size of the veins in the lower end of the œsophagus and in the rectum.

Hypertrophic cirrhosis of the liver is a form in which the liver is increased in size. The surface is usually smooth and the substance of a uniform character. This is due to the fact that the new connective tissue is uniformly distributed within as well as between the liver lobules. This form of disease may be the result of the same causes as the atrophic variety, but is more commonly due to obstructions of the flow of bile. Very commonly interference with the discharge of bile is found in this form, as interference with the circulation of blood is characteristic of the other variety.

Symptoms.— The symptoms of cirrhosis of the liver in earlier stages are very obscure and uncertain. Later interference with the portal circulation causes congestion of the mucous membrane of the stomach and intestines, with resulting disturbances of digestion, such as dyspepsia, vomiting, constipation, and even hemorrhages from the stomach or bowel. The spleen is enlarged from congestion of its substance and the last phase of the disease is marked by dropsical effusion in the abdominal cavity (ascites). Cirrhosis of the liver is a chronic disorder which may extend over a period of many years and which may be arrested even after it has reached an advanced stage. Among the symptoms of hypertrophic cirrhosis are tenderness and increase in the size of the liver, the development of jaundice, and sometimes the occurrence of fever. The disease is more rapid in its course than the atrophic variety.

Treatment.—The treatment of this condition is preventative rather than curative. When due to alcohol it may be arrested if not too well advanced, by a control of the habit of drinking; and a restitution of normal conditions may be favored by careful diet, including mainly the avoidance of stimulating or irritating food, and of general excesses of diet. The use of saline waters may be beneficial. When advanced to the stage of dropsy of the abdominal cavity, depletive measures, such as are used for the relief of dropsies in general, may be useful; or it may be necessary to remove the liquid by tapping.

Around this is deposited cholesterin or biliary pigment. The gall-bladder may contain a single stone or, more commonly, a number, and sometimes even hundreds are found.

Gall-stones are more common in women past middle life than in younger persons or in the male sex.

Symptoms may be wanting until a stone enters the cystic duct and becomes lodged in the latter, or passing through this, becomes obstructed in the common bile duct. The symptoms of such a passage of gall-stone are known as biliary colic. The patient is seized with intense pain, radiating to the right and to the back, sometimes as high as the right shoulder. Vomiting and other reflex disturbances and even collapse may occur. When the stone lodges, jaundice is the most pronounced symptom. Frequently the gall-stone passes with some effort and the paroxysm is relieved. Sometimes this relief is brought about by a recession of the stone into the gall-bladder.

Treatment.— The treatment of gall-stone consists of careful diet and the use of saline waters to improve the digestive conditions and render the bile as liquid as possible. Gall-stones may thus be diminished in size and enabled to pass through the ducts. During the paroxysm of biliary colic, remedies to relieve pain are imperatively necessary. Hypodermic injections of morphine and even narcosis with ether or chloroform may be required. Surgical operation for removal of the stone is often desirable.

ALFRED STENGEL, M.D.

Liver-leaf, or **Noble Liverwort.** See HEPATICA.

Liv'ermore, Mary Ashton Rice, American reformer and lecturer: b. Boston, Mass., 19 Dec. 1821; d. Melrose, Mass., 23 May 1905. She was married in 1845 to Rev. D. P. Livermore, a Universalist minister (d. 1899), and was early in life active in the anti-slavery and temperance movements. In 1862 she was appointed agent of the Northwestern branch of the United States Sanitary Commission at Chicago and after the Civil War period was conspicuous in her efforts to promote the woman suffrage and temperance movements. She was president of the Massachusetts Woman's Suffrage Association and for 10 years president of the Massachusetts Woman's Christian Temperance Union. Among her popular lectures are: 'What Shall We Do with Our Daughters?'; 'Women of the War'; 'The Moral Heroism of the Temperance Reform.' She is the author of 'Pen Pictures' (1865); 'Thirty Years Too Late' (1878); 'My Story of the War' (1888); 'The Story of My Life' (1897); etc.

Liv'erpool, England, a seaport city and civic county, in Lancashire, on the Mersey estuary, about four miles from its mouth on the Irish Sea, and 185 miles northwest of London. It is the second largest city in England, the most important commercial port of the British empire, and in the number of its shipping and its aggregate tonnage is the first in the world. The city, irregularly built, extends for six miles along the level ground of the dock and wharf-lined east bank of the river, and in a semicircle climbs the undulating slopes in the vicinity, the highest point of which rises 230 feet above the river. During the latter quarter of the 19th century, the demolition of old houses, the erection of vast warehouses and office buildings, the formation of new streets and the widening of old ones, have completely modernized the city. The modern public buildings are magnificent, while the new commercial buildings generally are of ornate classic design. Among the principal buildings are the town hall; the quadrangular building of the municipal offices 226 feet by 195 feet, centrally situated, with a conspicuous feature in its clock-tower and spire 200 feet high; St. George's Hall, a sumptuous building in the Corinthian style externally and internally, 420 feet long, with a colonnade of 16 columns, 200 feet long; the revenue buildings covering an area of 6,700 square yards, with a length of 467 feet, 67 feet high, and accommodating the inland revenue offices, posts and telegraphs, and the Mersey Dock and Harbor Board; the new Exchange in Italo-French Renaissance, with a frontage of 1,500 feet, lavishly decorated; and the free public library and museum, the gift of Sir William Brown, a local merchant, a handsome building of Corinthian order. One portion of the building is a reference library, with 120,000 volumes; the other section is the museum, containing departments of natural history and of antiquities. To the east of the library and museum another citizen, Sir Andrew Barclay Walker, has erected a public gallery of art, a splendid structure richly furnished with paintings and sculpture presented by other wealthy patrons of the arts, or purchased by the corporation. Between the museum and the art gallery the town council has erected as an addition to the library a public reading room, called the Picton reading room. In connection with the reference library there are six lending libraries in various parts of the city.

Other structures include many splendid piles of commercial buildings, banks, and charitable institutions. Those associated with maritime vocations are especially conspicuous and useful. Several new hotels have been built of great size and architectural splendor. The provision markets are spacious, airy, covered buildings, and are five in number. The Haymarket is an area of about 15,000 superficial yards, nearly half of which is roofed. Among the places of worship are St. Catherine's, St. Michael's, St. Nicholas'. St. Luke's, the Church for the Blind, Great George Street Chapel, Hope Street Unitarian Chapel, St. Francis Xavier's, and St. Mary's Roman Catholic chapels, St. Andrew's Scotch Church, and Sefton Park Presbyterian Church. When Liverpool was constituted a bishop's see in 1880, the parish church of St. Peter was made the cathedral, but a new cathedral is building, many liberal contributions having been made for the purpose.

Among the charitable and benevolent institutions are the royal infirmary, children's infirmary, Northern and Southern hospitals, lying-in institutions, dispensaries, etc., public disinfecting establishments, and public baths. There are also various orphanages, refuges for the destitute, and institutions for the relief of every form of human suffering. The educational institutions include the University College, Royal Institution, the Liverpool Institute, Liverpool College, school of art and gallery of art. The University College (for which a fine building has been erected) is one of those belonging to the Victoria University; it has a department of its, timber, tobacco, and wool. Cotton manufactures are the chief export, others are metals and articles in metal, machinery, woolens, etc. The value of the foreign and colonial merchandise imported in 1900 was $623,567,000, of the home and foreign produce exported, $512,864,000; amount of customs revenue, $20,873,900. The manufactures and other industries of Liverpool are varied, among them being hemp and wire rope making, sail making, iron forging, anchor and chain cable making, iron and brass founding, the making of steam-engines and other machinery, sugar refining, soap making, alkali making, etc. The manufacture of watches and chronometers is extensive. There are many large steam mills for grinding corn, rice, colors, dyewoods, etc. Ship-building is carried on to a small extent.

Four lines of railroad enter the city, namely the London & Northwestern railway; the Lancashire & Yorkshire; the Midland, Great Northern & Great Central, and the Great Western, to Birkenhead, and thence to Liverpool by ferry boats or by the Mersey Tunnel railway, a great work opened for traffic in 1886, 4½ miles in length, including the approaches.

The town is divided into 29 wards, which elect each three councillors. There are 29 aldermen and a lord mayor. The borough sends nine members to Parliament.

Liverpool is comparatively of recent growth. A castle was built here by Roger de Poictiers, to whom William the Conqueror gave the extensive tract of land between the Mersey and the Ribble. It was a small fishing town surrounded by a high mud wall when it was besieged and taken by Prince Rupert in 1644. In 1645 the Parliament settled the mill and ferry boats on the corporation as a satisfaction for their losses. In 1709 a wet dock was constructed, the first in the kingdom. From this event dated the rapid extension of its commerce and population. In 1880 Liverpool was made the see of a bishop, and in that year a charter was granted constituting it a city. The population, which in 1801 was only 77,653, in 1891 was 517,980; and in 1901, 686,332.

Liverpool, Nova Scotia, Canada, the capital of Queen's County, a town and port of entry on the south bank of the Mersey estuary at its entrance into Liverpool Harbor, 108 miles southwest of Halifax. It has large fisheries, and some manufactures of lumber, machinery, and shoes. Pop. (1901) 1,937.

Liv'erworts, or **Hepaticæ,** a group of cryptogamous plants, forming one of the two divisions of the class *Bryophyta* or *Muscineæ* (mossworts), and closely related to the true mosses (*Musci*), with which some of the species are apt to be confounded. They are either spread out in the form of a simple lobed thallus, showing differentiation into a dorsal (upper) and a ventral (lower) surface, or they are composed of a small ramified stem bearing sessile leaves in two or three ranks. Root-like bodies (rhizoids) attach the plant to its substratum. Many liverworts reproduce themselves by means of brood-cells (thallidia or gemmæ), formed asexually in cups on the surface, in leaf-margins, etc. They are also reproduced sexually by means of club-shaped antheridia, containing the male elements (antherozoids), and flask-shaped archegonia, containing each an egg-cell or oösphere. These sexual organs occur in groups either in small depressions or special outgrowths of the thallus, or as so-called flowers at the tips of the leafy shoots, or in the axils of their leaves. The spore-capsule is formed after fertilization within the archegonium, and the spores are often provided with hygroscopic elaters which assist in their dispersal. On germination a spore produces, not the common liverwort plant, but a very small filamentous protonema. There are four families of liverworts, namely, *Ricciaceæ, Marchantiaceæ, Anthocerotaceæ,* and *Jungermanniaceæ.* The first includes the duckweed-like crystalwort (*Riccia natans*); the second the exceedingly common *Marchantia polymorphia,* formerly used as a basis for medicine for ailments of the liver (whence the name «liverwort»); and the last, which is much the largest family, comprises all the leafy, as well as some thalloid forms. The Hepaticæ are generally distributed over the world, and prefer situations similar to those occupied by the mosses. There are about 4,000 species, of which about 3,500 belong to the *Jungermanniaceæ.* See authorities on cryptogamic botany, especially Cooke's ‹British Hepaticæ› (1893); and Strasburger, ‹Text-book of Botany› (1903).

Liv'ia, Livilla, Roman woman; d. 35 A.D. She was a granddaughter of Livia Drusilla (q.v.) by Drusilla's other son, Drusus Germanicus. She married her cousin, Drusus, a son of Tiberius, and having poisoned her husband in concert with Sejanus, died in a dungeon.

Livia Drusilla, Roman empress: b. about 56 B.C.; d. 29 A.D. She was a daughter of Livius Drusus Claudianus, and was first married to Tiberius Claudius Nero, who was the father of her sons, Tiberius and Drusus. Tiberius Nero was obliged to divorce her in order to gratify Augustus, who divorced his own wife Scribonia in order to marry her. Having no children by her, the emperor adopted her sons by her first husband, one of whom, Tiberius, became his successor.

Liv'ingston, Edward, American statesman: b. Clermont, N. Y., 26 May 1764; d. Rhinebeck, N. Y., 23 May 1836. He was graduated from the College of New Jersey in 1781, was admitted to the bar in 1785, was a New York representative in the 4th, 5th, and 6th Congresses (1795–1801), and was a leader of the opposition. In 1801 he was appointed by President Jefferson United States attorney for the New York district, and in that year became also mayor of New York. During the yellow fever epidemic in 1803 he was stricken with the disease, and during his illness $43,666.21, for which he was responsible to the United States government, were misappropriated by his fiscal agent. He confessed judgment in favor of the United States for $100,000, and resigned both his offices. In 1804 he began the practice of law and land speculation at New Orleans. At the time of the preparation for the battle of New Orleans, he was president of the committee of public defense, and Jackson's chief assistant. During the battle he served on Jackson's staff. In 1820 he was elected a representative to the State legislature of Louisiana, in 1823–9 represented the New Orleans district in Congress, and from 7 Dec. 1829 to 3 March 1831 was United States senator from Louisiana. In 1831 he became secretary of state in Jackson's cabinet. This post he resigned to become minister to France in 1833; and in 1835 he returned to the United States. He was a distinguished lawyer; and as secretary of state exercised strong influence on the administration of Jackson, whose state papers, including the Nullification proclamation of 10 Dec. 1832, are generally believed to have been written by him. Among his writings are: 'System of Penal Law for the State of Louisiana' (1826); 'System of Penal Law for the United States' (1828). His 'Complete Works on Criminal Jurisprudence' appeared in 1873. Consult the biography by Hunt (1864).

Livingston, Henry Brockholst, American jurist: b. New York 26 Nov. 1757; d. Washington, D. C., 19 March 1823. He was a son of William Livingston (q.v.), and graduated from the College of New Jersey in 1774, was commissioned a captain in the Continental army, and later became aide to Gen. Philip Schuyler in the northern department with rank of major. He was also aide to Gen. Arthur St. Clair, took part in the siege of Ticonderoga, and was present at Saratoga. Subsequently he was again with Schuyler and was promoted lieutenant-colonel. In 1779 he went to Spain as private secretary to John Jay, in 1782 on the return voyage was captured by the British, and was for a time imprisoned at New York. In 1783 he was admitted to the bar and entered practice in New York. He was judge of the New York supreme court in 1802–7, and in 1807 became associate justice of the United States Supreme Court. On the organization of the New York Historical Society in 1805 he became its 2d vice-president.

Livingston, Peter van Brugh, American merchant: b. Albany, N. Y., October 1710; d. Elizabethtown, N. J., 28 Dec. 1792. He was graduated from Yale in 1731, at New York was active in the shipping business with William Alexander, Lord Stirling, and in 1755 provided the supplies for Governor Shirley's expedition to Acadia. He was long a member of the provincial council, and in 1775–6 was a delegate to the 1st and 2d provincial congresses of New York, of the former of which he was president. In 1776–8 he was treasurer of the congress. He was prominent in most of the measures that led up to the Revolutionary War, and was referred to by John Adams as «stanch in the cause.»

Livingston, Philip, American patriot: b. Albany, N. Y., 15 Jan. 1716; d. York, Pa., 12 June 1778. He was graduated from Yale in 1737, became a prosperous merchant in New York, in 1758–69 was a member of the Colonial assembly, of which he was speaker in 1768, but was unseated by the Tory majority because of his strong Whig views. In 1774–8 he represented New York in the Continental Congress, and in 1776 signed the Declaration of Independence. Subsequently he sat in the New York provincial congress, in the State assembly, and in the senate. His legislative services were many.

Livingston, Robert, English proprietor in America: b. Ancrum, Scotland, 13 Dec. 1654; d. Albany, N. Y., 20 April 1725. He emigrated to America in 1673, spent a part of a year at Charlestown, Massachusetts Bay, removed to Albany, N. Y., and was there in 1675–86 secretary of the commissaries who directed the affairs of Albany, Schenectady, and the region adjacent. In 1686–1721 he held the corresponding office of town-clerk. In 1686 he received from Gov. Thomas Dongan the grant of a large tract, which comprised extensive portions of the present counties of Dutchess and Columbia, and which was confirmed by royal charter of George I. in 1715. This tract was erected into the lordship and manor of Livingston, and as Livingston Manor has since been known. Livingston was the first to obtain the means for the equipment of the expedition of Capt. William Kidd (q.v.) against the pirates. He was elected member of the assembly for Albany in 1711, and sat for his manor in 1716–25. From 1718 he was speaker.

Livingston, Robert R. (the initial R. having been assumed for purposes of distinction), American statesman, commonly known as «Chancellor Livingston»: b. New York 27 Nov. 1746; d. Clermont, N. Y., 26 Feb. 1813. He was graduated from Columbia (then King's College) in 1765, was admitted to the bar in 1773, was for a brief period partner in legal practice with John Jay, in 1773–5 was recorder of New York city, lost this post through his revolutionary spirit, and in April 1775 was elected from Dutchess County to the New York State assembly. In 1776 he was sent by the assembly to the Continental Congress, where he was one of the committee of five appointed to draft the Declaration of Independence, which, however, he did not sign owing to his return to enter the provincial convention. He took his seat on 8 July 1776, and was of the committee to draw up a State constitution. Under this instrument he became the first chancellor of New York (1777–1801). He resigned from the Continental Congress in 1777, but was again one of its members in 1779–81. He was secretary for foreign affairs of the United States Confederation in 1781–3, in which post he conducted with much success the business previously entrusted to the committee of secret correspondence. As chancellor he administered the oath of office to George Washington on the latter's inauguration as first president of the United States (30 April 1789). In 1801–5 he was minister to France, in which capacity he, with James Monroe as additional plenipotentiary, concluded the treaty by which Louisiana was ceded to the United States for the sum of $15,000,000. He became the partner of Robert Fulton (q.v.) in experiments toward the employment of steam-power in navigation; launched a boat on the Seine, but was not fully successful; and later continued the work with Fulton in the United States, where in September 1807 the Clermont made the trial trip from New York to Albany in 22 hours, the average rate of speed thus being 5 miles per hour. Livingston also introduced merino sheep into New York, made general the use of gypsum for fertilizing purposes, was the principal founder (1801) of the New York Academy of Fine Arts and its first president, and was also for a time president of the New York Society for the Promotion of Useful Arts. He was styled by Franklin the «Cicero of America.» By act of Congress his statue was placed in the Capitol at Washington, as one of the two representative citizens of New York State, George Clinton being the other. He published 'Essays on Agriculture,' an 'Essay on Sheep' (1809), and some addresses. Consult the biographical sketch by De Peyster (1876).

Livingston, William, American statesman: b. Albany, N. Y., 30 Nov. 1723; d. Elizabethtown, N. J., 25 July 1790. He was graduated from Yale in 1741, was admitted to the bar in 1748, attained distinction in practice, was elected to the provincial legislature from Livingston manor, and in 1760 established himself at the well known country-seat of «Liberty Hall» at Elizabethtown, N. J. In 1774 he became a delegate for New Jersey province to the 1st Continental Congress, and later served in the 2d and 3d Congresses. He was a member of the committee of the 1st Congress that prepared the address to the people of Great Britain. In June 1776 he took command of the militia of New Jersey, with rank of brigadier-general, and was thereby prevented from signing the Declaration of Independence. On 28 Aug. 1776 he was elected first governor of New Jersey, and this post, having resigned his military command, he held until his death. During the first two years of his administration the State of New Jersey was perhaps more than any other exposed to the operations of the British forces, and this was the cause of many difficulties and dangers. The legislature was compelled to meet at various different places, and Tory hostility was strong against the governor, whose capture was several times attempted. In his message of 1777 to the assembly, Livingston recommended the abolition of slavery, and in 1786 caused the passage of an act forbidding the importation of slaves into New Jersey and himself liberated his two slaves. In 1787 he was appointed a delegate to the convention that framed the Constitution of the United States. He was at one time president of the «Moot,» the well known lawyers' club founded at New York in 1770. He published in 1752 52 numbers of ‹The Independent Reflector,› a weekly periodical, in which he opposed the Episcopal Church. His writings include: ‹Philosophic Solitude› (1747); ‹A Funeral Eulogium on the Rev. Aaron Burr› (1757); and ‹A Digest of the Laws of New York, 1691–1762› (with W. Smith, Jr., 1752–62). Consult Sedgwick, ‹Life and Letters of William Livingston› (1833).

Livingston, Mont., city, county-seat of Park County; on the Yellowstone River, and on the Northern Pacific railroad; about 45 miles north of the Yellowstone National Park, and 100 miles southeast of Butte. It is situated in a mining and lumbering section of the State. A branch of the Northern Pacific railroad extends from Livingston to the Yellowstone Park. It is the division headquarters for the Northern Pacific. The railroad depot cost $75,000. Its chief manufacturing establishments are machine-shops, lime-works, railroad shops, and lumber-mills. Its trade is mainly in mining tools, wool, coke, coal, and gold, and it is a distributing centre for groceries, dry goods, and clothing for an extensive region. Livingston is a favorite resort for sportsmen, as game and fish abound. Pop. (1900) 2,778.

Livingston College, a coeducational institution founded in 1882, in Salisbury, N. C., under the auspices of the African Methodist Church. In 1903 there were connected with the school 24 instructors and 360 students. The library contains about 5,000 volumes; the buildings and grounds are valued at $130,000; and the productive funds $110,000. The college course leads to the A.B. degree.

Livingston Manor, at one time a large tract of land in New York State, on the east side of the Hudson River, and the northern part of what is now Dutchess County. This land was obtained by Robert Livingston, in 1674, and comprised about 160,240 acres. The title was confirmed in 1715, and the patent obtained gave the land to the heirs forever. In 1752–4 Gov. Clinton of New York had to settle a dispute as to the eastern boundary; Massachusetts and the Livingstons both claiming the same land. The manor was divided and subdivided into holdings which are let to tenants. In 1795 the tenants made an effort to have the title pronounced invalid, but it was decreed that the land was Livingston property. In 1844 the tenants again sought to get possession, and they petitioned the Legislature to set aside the grant; but the petition was not granted. Since that time the owners have sold to individuals the larger part of the old Livingston Manor.

Livingstone, lĭv'ĭng-stŏn, **David,** Scottish missionary and African traveler: b. Blantyre, Lanarkshire, 19 March 1813; d. near Lake Bangweolo, Africa, 1 May 1873. His parents had settled in the neighborhood of the cotton mills near Blantyre, where David became a «piecer» at the age of 10. While at work in the mill he learned Latin and read extensively, and having attended the medical and Greek classes at Glasgow University during the winter months, finally became a licentiate of the Faculty of Physicians and Surgeons of Glasgow. Under the direction of the London Missionary Society he proceeded in 1840 to South Africa, where he joined Robert Moffat in the missionary field. His first station was in the Bechuana territory, and here his labors for nine years were associated with Mr. Moffat, whose daughter he married. Hearing from the natives that there was a large lake north of the Kalahari desert, he proceeded to explore that region, and discovered the valley of the Zouga and Lake Ngami. Subsequently he penetrated farther northwest until he reached Linyanti, the capital of the Makololo territory, situated on the Chobe, a tributary of the Zambesi, which river he also visited. In 1853–6 he made a great exploratory journey, or series of journeys. Starting from Linyanti he ascended the Leeambye (Upper Zambesi), journeyed overland to Lake Dilolo, and thence to St. Paul de Loanda on the west coast. Returning to Linyanti, he went eastward from there in 1855, tracing the Zambesi to the Indian Ocean, and reaching Quilimane on the east coast in 1856, having thus crossed the entire continent. The record of this journey is found in his ‹Missionary Travels and Researches in South Africa› (1857). After making various journeys and exploring the Lake Nyassa and Zambesi region, Livingstone set forth in 1865 to set at rest the question of the sources of the Nile. From this time till his death he was engaged in laborious explorations in the lake region of South Africa, especially to the westward of Nyassa and Tanganyika, where he discovered Lakes Bangweolo and Moero, the Upper Kongo, etc. For about three years no communication had come from him, and the doubts regarding the traveler's safety were only set at rest when it was known that H. M. Stanley, the special correspondent of the New York *Herald*, had seen and assisted Livingstone at Ujiji, on Lake Tanganyika. They parted in March 1872, Livingstone going to explore the southern end of Tanganyika, and Stanley proceeding to Zanzibar. After another year's wanderings he was attacked with dysentery near Lake Bangweolo, and there he died. His body was buried in Westminster Abbey, having been conveyed to the coast, rudely preserved in salt, by his faithful followers. Consult: 'Livingstone's Last Journals' (1874); Stanley, 'How I Found Livingstone' (1873); Blaikie, 'Livingstone's Personal Life' (1880); Hughes, 'David Livingstone' (1891); Johnston, 'Livingstone and the Exploration of Central Africa' (1897); Machlachlan, 'David Livingstone,' in 'Famous Scots' Series (1900).

Livingsto'nia Mission, southern Africa, established in 1875 by the Free Church of Scotland, consists of two settlements with local branches. The first settlement was made at Cape Maclear at the southern end of Lake Nyassa, but the chief settlement is at Bandawè, on the west shore of the lake. The establishment of the mission was the result of a suggestion made by Livingstone (q.v.) that the shore of this lake was a good position for a mission that might counteract the slave trade which was carried on by the Arabs and Portuguese. The Church of Scotland established a mission at Blantyre, in the Shiré Highlands, near the lake. At Blantyre some manufacturing establishments have been established, a foundry, basket factory, cloth-mill (the cloth is made from the bark of trees), and a cotton factory. The Portuguese, in 1889, tried to get possession but since 1890 the British have had control.

Liv'ius, Andron'icus, Roman poet, by birth a Greek of Tarentum. He first went to Rome at the commencement of the 3d century B.C. as instructor to the children of Livius Salinator. He introduced upon the Roman stage dramas after the Grecian model, and wrote a translation of the 'Odyssey' in the old Saturnine verse. His fame, however, rests chiefly upon his hymn written in celebration of the battle of the Metaurus River.

Livo'nia, Livland, or Riga, Russia, a Baltic province, bounded north by Esthonia, west by the Baltic Sea, south by Courland, and east by Vitepsk and the Lake of Peipus; length, 178 miles; breadth, 111 miles; area, about 18,158 square miles. The surface is for the most part flat, sandy, and swampy; the only hilly ground is in the districts of Venden and Dorpat. The government is well watered by the Dwina or Duna, and Embach; its principal lakes are the Vertserf and Luban. The climate is subject to extremes of heat and cold. Notwithstanding extensive tracts of sand, the greater part of the government is under cultivation, and yields good crops of oats, barley, wheat, potatoes, flax, and hops. The forests are extensive, and furnish good timber. Horses, cattle, and sheep are generally of small inferior breeds. Distilling, sugar refining, and the manufacture of tobacco, woolens, cotton, and linen, are the chief industries. The inhabitants consist of Livonians, of Russian, Swedish and German origin, who form the landed proprietors and governing class, and are divided into the nobility and bourgeoisie; and Esthonians and Letts, who form the peasantry, and though no longer serfs (having obtained their freedom in 1824), are bound to perform certain oppressive duties for the lords of the soil. The Esthonians occupy the north and east portion of Livonia; the Letts the south and west. The Esthonians are of the Finnish stock (see FINNS); the Letts, like the Lithuanians, belong to the Slavonic stock, and speak a language of their own (Lettish). Of the original inhabitants of the country, the Lives or Livonians proper, who are also of Finnish race, only a thousand or two are all that are left. The inhabitants are almost all Protestants of the Augsburg Confession. The capital is Riga. Pop. (1897) 1,300,640.

Livre, lē'vėr, an ancient French coin, now superseded by the franc, to which it was about equal in value.

Livy (TITUS LIVIUS), Roman historian: b. Patavium (Padua) 59 B.C.; d. there 17 B.C. He spent most of his time at Rome, but kept aloof from active political life, although among his friends were numbered the most eminent men of his day. In spite of his republican leanings, he was befriended by Augustus, who counted him with Virgil and Horace, as one of the literary ornaments of his court. His principal work is the 'History of Rome' in 142 books (*Titi Livii ab Urbe Condita Libri*), which comprehends a period extending from the building of the city to the year 9 B.C. Only 35 of these books are extant, namely the first 10, which cover the period ending 293 B.C., and the 25 from the 21st to the 45th books, which comprehend the years between 218 and 167 B.C., as well as a number of fragments, and short abstracts, or tables of contents of all the books excepting the 136th and the 137th. Livy undertook this work, as he states in his preface, partly that he might plunge his mind into things of the past, and so forget the grievances of the present, and partly that he might spread out before his contemporaries a picture of the nation's ancestral glories. He has indeed produced a work which is truly national, which has always received the admiration and esteem of antiquity, and is in modern times regarded as one of the most precious relics of Latin literature. Since his time it has been the source of all knowledge of the period it deals with. He began its composition between the years 27 B.C. and 25 B.C., and published it from time to time in a series of detached parts; the present division into decades is of later origin. It appears that he was engaged upon his history up to the time of his death, but failed to carry it on to the end he had meditated, which would have included the death of Augustus. He had a practical object in view in the accomplishment of his task, but this was less to achieve a critical and scientific exploration of the past, than to produce a moving, lifelike, and readable representation of the time and country in which he lived. With this end in view he has chosen a style of his own; not the transparent splendor of Cicero, nor the condensed and epigrammatic pungency of Tacitus, nor the dilettante, though sometimes effective, archaism of Sallust. His narrative moves along with stately dignity; it teems with anecdote, and glows with patriotic emotion. He employs a phraseology remarkable for copiousness, for picturesqueness, for vivid description and occasionally for an eloquence that is burnished into poetic lustre. His materials must mainly have been derived from preceding annalists, but he weaves into his work the local traditions of a mythic age, and rivals Virgil in his love for the fables of Tuscany and Latium. His account of the Punic wars he draws from Polybius. We must not, however, expect to find in his writings a clear account of the origin and development of the Roman constitution. He seems to have cared little for the study of constitutional law, and even less for that of military art. Yet his political views were very decided, and in his account of the civil war, which resulted in the downfall of the Republic, he shows himself a strong partisan of the aristocratic party, so that Augustus did not hesitate to style him a Pompeian. The historic basis for the Roman history of Livy cannot be fully understood without reading the works of Niebuhr. Livy's complete works have been published by Gronov (1679); Drakenborch (1828); Zingerle (1883); and a translation of them appears in the Bohn Library. Fügner's ‹Lexicon Livianum› (1889) is important in Livian literature. Consult: Niemann, ‹Etudes sur la Langue et Littérature de Live› (1884); Taine, ‹Essai sur Tite Live› (1888); Madvig, ‹Emendationes Livianæ› (1877).

Liz'ard Point, or The Lizard, England, a headland in Cornwall, forming the southernmost point of Great Britain, 24 miles southeast of Land's End, and having two lighthouses with fixed lights 224 feet above sea-level.

Lizards, animal reptiles of the order *Lacertilia* which, together with the *Ophidia* (serpents), form the higher group *Sauria*. The one important character distinguishing lizards from snakes is the fact that the mandibles of the lower jaw are solidly united in the former and not in the latter. The lizards have generally two pairs of limbs, but one or both pairs may be absent (as in the amphisbæna), and the toes may vary in number from two to five. Though the front limbs may be wanting, the pectoral arch or bones of the shoulder-girdle are still represented; but when the hinder limbs are wanting, the pelvic arch also disappears. The spine is generally elongated, and a tail of considerable length is generally present. In most *Lacertilia,* the vertebræ are either hollow in front and convex behind (procœlous), or hollow at both ends (amphicœlous), the former condition being much more common than the latter. The cervical or neck-vertebræ may be furnished with ribs, and those of the back or dorsal region generally become united to the sternum or breast-bone. In the flying-lizard or dragon some of the hinder ribs become elongated and extended to form a support for the wing-membrane, by which this lizard is enabled to sustain itself in the air. The teeth are simple in structure, are not lodged in distinct sockets, and they generally become united to the jaw-bones with age. They vary much in form, from a toad-like plumpness to the slender shape of a snake. The food of lizards is generally insects, worms, and various small animals, but some live on vegetable substances. The eyes are provided with movable eyelids, while the ear is usually to be perceived externally. The skin is generally covered with scales or horny plates, although the integument — as in the chameleons, etc.— may be soft; and the epidermis is shed in patches annually. In their reproduction lizards never undergo any metamorphosis, and are generally oviparous, but in some the eggs are retained until they hatch within the abdomen of the mother. Salivary glands are found which in *Heloderma* act as poison glands. The lungs are thin-walled sacs, from which terminal pouches may arise. The movement of the ribs assists in respiration. The lizards are most abundant in tropical regions, but are absent only from the cooler temperate and the frigid regions of the globe.

The *Lacertilia* are divided into three sub-orders, of which the following is an outline:

Sub-order 1. *Geckones.*— *Lacertilia* with four legs, amphicœlous vertebræ and clavicles dilated ventrally. The chorda persists and grows throughout life, in the centre of and between the vertebræ; the ribs are bifurcated, and dentition is pleurodont. Some species have mechanically adhesive disks. This is a very old group, modern species existing in tropical and southern European countries. See Gecko.

Sub-order 2. *Lacertæ.*— *Lacertilia* with procœlous vertebræ and the ventral part of clavicles not dilated. Eighteen families, as follows:

1. *Agamidæ.*— A family of exclusively Old World lizards, containing some 200 species, among which the Malayan dragon (q.v.), and the frill-lizard (q.v.) are remarkable species. Many have a very chameleon-like appearance and are known in India and Ceylon as blood-suckers (genus *Calotes*). The desert lizards of North Africa and southwestern Asia are mostly of this family. See Agama.

2. *Iguanidæ.*— A large and chiefly American family with pleurodont dentition, and a short, thick, non-protractile tongue. The genus *Anolis* contains the common «chameleon» of the southeastern United States. (See Anolis; Chameleon.) *Basiliscus,* of Central America has a great, erectile vestigial crest on the back and tail. (See Basilisk.) *Iguana* (q.v.) includes large edible lizards of Central and South America. *Phrynosoma* is the genus of the «horned toad» (q.v.), common in the arid region of the Great Plains and west to California. One of the most northerly species is the large, black, fat-bodied, bud-eating lizard of the sandy plains of southern California, known locally as Alderman lizard, or by the Indian name Chuckwalla; and scientifically named *Sauromalus ater.*

3. *Xenosauridæ.*—A Mexican family intermediate between the *Iguanidæ* and the *Anguidæ;* represented in Africa by (4) the *Zonuridæ.*

5. *Anguidæ.*— Terrestrial pleurodont lizards, with bony plates in the skin and the tail long and brittle, dwelling in Central America, Europe and India. *Ophisaurus,* the genus of the glass snakes (q.v.) of the Central States, has the limbs reduced to mere spikes. *Anguis,* the «slow-worm» (q.v.), has no limbs at all, and the eyes well developed.

6. *Helodermatidæ.*— Pleurodont, poisonous lizards of New Mexico and Arizona. See Gila Monster. The (7) *Lanthanotidæ* are Asiatic representatives of the foregoing.

8. *Varanidæ.*— Pleurodont aquatic lizards of the Old World, with bifid, protractile tongue. See Monitor Lizards.

9. *Xantusiidæ.*— Three Central American genera.

10. *Tejidæ.*— A large tropical-American fam-

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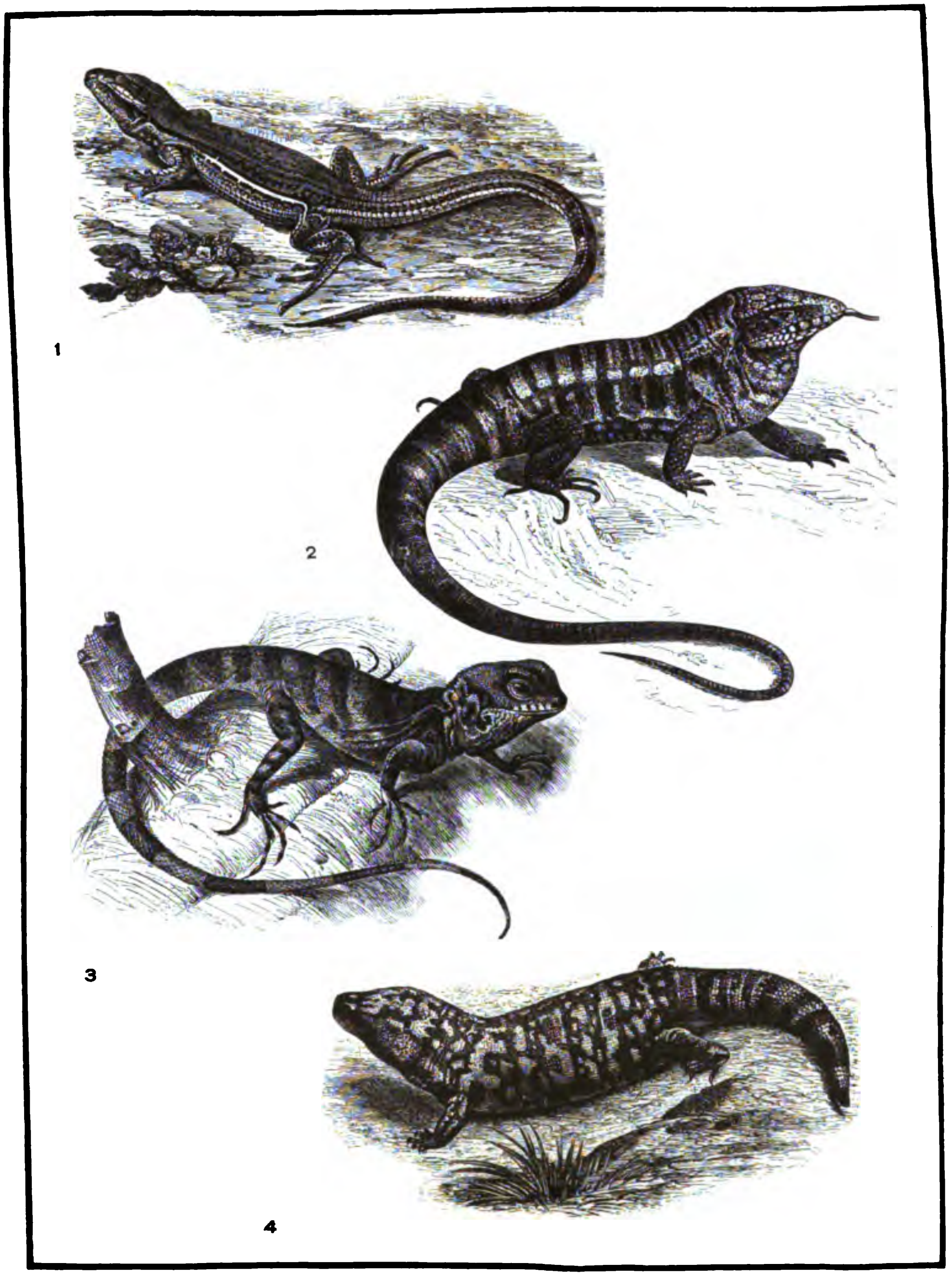
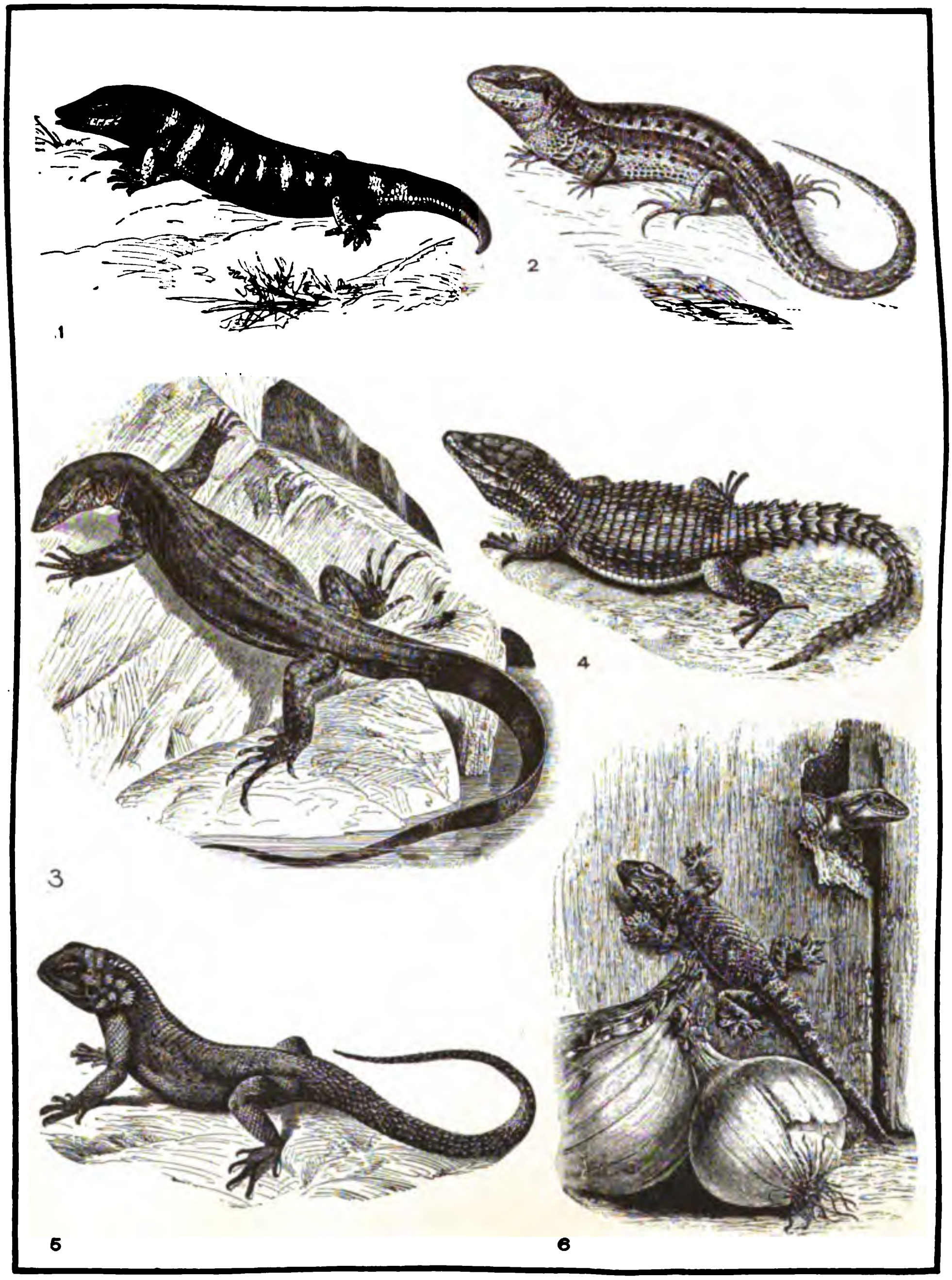
AMERICAN LIZARDS.



1. Uraniscodon umbra.
2. Teju or Tupinambis.
3. Surinam ameiva.
4. Gila Monster or Heloderma.

OLD WORLD LIZARDS.



1. Skink.
2. Lacerta ogilis.
3. Nile Monitor or Varanus.
4. Zonurus cordylus.
5. Agama colonorum.
6. Wall geckos.

ily of large forest dwelling, carnivorous lizards of great strength and swiftness. See TEJU.

11. *Lacertidæ.*— Typical small lizards of the Old World, with pleurodont dentition, and bony dermal plates over the temporals. About 100 species. All live on animal food, chiefly insects, worms and snails. The sand-lizard (*Lacerta agilis*) occurs in the Palæarctic region; the green lizard (*L. viridis*) inhabits central and southern Europe; and the wall-lizard (*L. muralis*) runs over the walls in Mediterranean cities.

12. *Gerrhosauridæ.*— African lizards intermediate between *Lacertidæ* and *Scincidæ.*

13. *Scincidæ.*— Pleurodont, viviparous lizards, with feebly nicked, scaly tongue. They live in sandy ground, where they make burrows in which they retreat. The limbs are in some groups reduced. The family contains about 400 species distributed all over the world. See SKINK.

The following five families have become degraded on account of their burrowing instincts: (14) *Anelytropidæ,* worm-like, legless lizards of the tropics; (15) *Dibamidæ,* of Malay Archipelago; (16) *Anjellidæ,* worm-like lizards of California, limbs entirely absent; (17) *Amphisbænidæ,* worm-like blind, burrowing lizards which burrow like earthworms, especially in ants' nests and manure heaps. *Chirotes* of Mexico and California has the fore-limbs remaining; *Amphisbæna,* in tropical America, lives in ants' nests. See AMPHISBÆNA.

(18) *Pygopodidæ.*— Snake-like lizards; fore-legs absent; hind-legs a pair of scaly flaps; Australasia.

Sub-order 3. *Chamæleontes.*—Old-World saurians, with compressed body and prehensile tail; tongue club-shaped and capable of being protruded to a distance equal to the length of the body; two digits of the feet are permanently opposed to three; head crested; eye-balls very large and movable on the two sides independently of each other; capacity for changing color conspicuous. See CHAMELEON.

For information on this group consult: Gadow, ‹Amphibia and Reptiles› (1902); the ‹Royal› and ‹Standard› Natural Histories; and Boulenger's ‹Catalogue of Lizards in the British Museum› (1885-7).

Lla'ma, one domesticated form (often specifically distinguished as *Lama glama* of the huanaco (q.v.), the other being the wool-bearing Alpaca (q.v.). It is larger than the wild huanaco (about 3 feet at the shoulder), and may be white, brown, black, or variegated with patches of all three colors. This animal was domesticated long before the era of the Incas. When the Spaniards conquered Peru they found hundreds of thousands in use as riding animals and beasts of burden in the southern part of the country; and as they were the only domestic ungulate of the kind in South America their importance was very great. The Spanish conquerors adopted llamas as burden-beasts, and soon long strings, in charge of a few native drivers, were passing back and forth between the mountain mines and the coast, laden with ore or bullion or with supplies, a proper burden not exceeding 120 pounds, which may be carried about 12 miles a day. Until toward the middle of the 19th century this remained almost the only means of carriage in the Cordilleras, where the endurance of cold, ability to live on the mountain herbage, and sure-footedness peculiarly fitted them for this service. Only the mature males were used as burden-beasts, the smaller females being reserved for their milk and flesh, which resembles mutton, and is extensively eaten. Llamas produce only one offspring annually, so that care is needed to sustain the herds which are still numerous and valuable. Various breeds are known, but the differences are not very great. The wool is used among the native Indians for the manufacture of textile fabrics. The skin is made into leather. The dried dung is used for fuel, and the milk is also employed as an article of native diet. When irritated these animals have the habit of kicking at their adversaries, and they also eject the food when undergoing re-mastication in the mouth, along with quantities of saliva.

Llanelly, lă-nĕth'lĭ, Wales, a seaport town of Carmarthenshire, on the Burry, 14 miles southeast of Carmarthen. It is the outlet for the products of a great mining district, with extensive collieries, iron-foundries, copper works, tin-plate works, and lead and silver works. The trade is facilitated by commodious docks and ample harbor accommodation. Pop. (1901) 24,213.

Llano Estacado, lä'nō ās-tä-kä'dō, or **Staked Plain,** Texas, an extensive plateau forming part of the Great Plains of the eastern slope of the Rocky Mountains, east of the Pecos River, in northwestern Texas and eastern New Mexico. It has an area exceeding 40,000 square miles, and is dry and almost woodless; water is obtained by boring. In the north the plateau has a general elevation of about 5,000 feet, but in the south is not over 1,000 feet high, the steep escarpments or palisades on all sides having suggested its Spanish title.

Llanos, lä'nōs or lyä'nōs, the name given in the northern part of South America, particularly in Colombia and Venezuela, to vast plains, almost entirely level, and interrupted only at intervals by detached elevations, called in Spanish, mesas. The superficial area of the llanos is estimated at 300,000 square miles; they extend from the delta of the Orinoco inland to the Yapura, a tributary of the Amazon. A large portion of them is sandy and without much vegetation, except on the banks of the rivers and during the wet season. At this period great stretches are inundated to the depth of 12 to 15 feet, owing to the rivers overflowing their banks. The villages must, therefore, be built on the elevated ground. Considerable portions are covered with forest; in the grassy regions great herds of cattle pasture. Not including the forest section, nor any of the foot-hills of the Andean Cordillera, the llanos of the northern part of South America would cover only about 150,000 square miles. The inhabitants of these plains are called Llaneros. They are a hardy, vigorous race, proud of their descent from the first Spanish colonists, although their mode of life resembles more that of the Indians than that of their boasted ancestors. Farther to the south such plains are called Pampas.

Llanquihue, lyăn-kē'wā, a lake in the province of the same name, in Chile, South America. Largest lake in Chile; nearly circular in form, about 30 miles in length and the same in width. It is a deep lake, with only very small inlets.

Llorente, Juan Antonio Don, hoo-än' än-tō'nē-ō dōn lyō-rān'tā, Spanish historian: b. Rincon de Soto, Andalusia, 30 March 1756; d. Madrid 5 Feb. 1823. He studied theology at Tarragona and Madrid, was ordained priest in 1770; was doctor in canon law, chancellor of the University of Toledo; was commissary of the Inquisition at Logrono in 1785, and general secretary of the Inquisition at Madrid in 1789. He was commissioned in 1793 to draw up plans for a general reform of the procedure of the court. His greatest work is the ‹Critical History of the Spanish Inquisition› (1815–17), which, however, has no authoritative standing among scholars. He wrote also ‹Memoirs Relating to the History of the Spanish Revolution› (1815–19).

Lloyd, loid, **Charles Harford,** English musician: b. Thornbury, Gloucestershire, 1849. He displayed musical talent early, and at 10 was organist of Rangeworthy Church, and after 1862 studied music with Barrett of Bristol, confining his attention almost entirely to Bach and Beethoven. He was graduated from Oxford, where he came under the influence of Stainer, and definitely determined to make music his calling. He conducted the Gloucester musical festivals of 1877 and 1880, was organist of Gloucester cathedral in 1876 and of Oxford cathedral in 1882. Since 1892 he has been precentor and musical instructor at Eton. Among important compositions of his are the cantatas of ‹Hero and Leander›; ‹The Song of Balder›; ‹Andromeda›; ‹Alcestis›; ‹Song of Judgment›; ‹Longbeard's Saga.› He has also written many songs and much church music.

Lloyd, Curtis Gates, American mycologist: b. Florence, Ky., 17 July 1859. One of the founders of the Lloyd Library and collector of one of the most complete mycological museums in America. He is author of a series of bulletins on ‹Mycological Notes›; and co-author of ‹Drugs and Medicines of North America.› Mr. Lloyd has done much toward correcting existing errors respecting mycological species.

Lloyd, David Demarest, American playwright: b. New York 1851; d. Weehawken,

Lloyd, loid, **David Demarest,** American playwright: b. New York 1851; d. Weehawken, N. J., 1889. He was a brother of H. D. Lloyd (q.v.). He was graduated at the College of New York, and became a member of the staff of the New York *Tribune.* As a correspondent at Albany in 1875 he was prominent in exposing the canal ring. He was the author of four plays: ‹For Congress› (1883); ‹The Woman Hater› (1885); ‹The Dominie's Daughter› (1887); ‹The Senator› (1889).

Lloyd, Henry Demarest, American writer on economics: b. New York 1 May 1847; d. 28 Sept. 1903. He was graduated from Columbia University; lectured on political economy in New York schools; studied law, and was admitted to the bar in 1869. In 1872 he went to Chicago, where he was employed on the Chicago *Tribune* till 1885, the latter part of the time as a member of the editorial staff. His later life was devoted to writing. His publications include: ‹A Strike of Millionaires against Miners, the Story of Spring Valley› (1890); ‹Wealth against Commonwealth› (1894), a history of the growth and methods of the Standard Oil Company; ‹Labor Copartnership› (1899), notes of visits to various co-operative shops and farms in Great Britain; ‹A Country without Strikes› (1900), an account of the history and workings of compulsory arbitration in New Zealand; and ‹Newest England› (1900). He made the labor question his special field of research, and was an advocate of co-operation and a believer in socialistic — or, as he called it, democratic — control of industry, to which he maintained that social evolution was leading. He possessed the power of presenting economic facts in an unusually interesting manner, especially his ‹Wealth against Commonwealth,› though compiled from court records and other official documents, is written with a force and vividness which give it real literary quality.

Lloyd, John Uri, American chemist and author: b. West Bloomfield, N. Y., 19 April 1849. He was educated in private schools; became professor of pharmacy at the Cincinnati College of Pharmacy, and held that position till 1887. He has been professor of chemistry in the Eclectic Medical Institute since 1878, and is now its president; and is associate editor of the ‹Pharmaceutical Review,› the ‹Eclectic Medical Journal,› and the ‹Medical Gleaner.› He has made special studies in the dialect, superstitions, and folk-lore of northern Kentucky, is a member of many societies, contributor to chemical and pharmaceutical journals, and has written: ‹Chemistry of Medicine› (1881); ‹Etidorpha, the End of the Earth› (1895); ‹The Right Side of the Car› (1897); ‹Stringtown on the Pike› (1900); ‹Warwick of the Knobs› (1901); ‹Red Head› (1903); and, in collaboration, ‹Drugs and Medicines of North America› (1884); ‹King's American Dispensatory,› with King (1885–1900); ‹Elixirs, their History and Preparation› (1892); ‹A Study in Pharmacy› (1895).

Lloyd, Nelson McAllister, American journalist and author: b. Philadelphia 18 Dec. 1873. He was educated at the Germantown Academy, and graduated in electrical engineering at the Pennsylvania State College in 1892. Since then he has been engaged in newspaper work on the New York *Evening Sun,* of which he has been city editor since 1897. He has contributed many historical sketches and short stories to magazines, and has also published ‹The Chronic Loafer› (1900); and ‹A Drone and a Dreamer› (1901).

Lloyd's, an incorporated firm engaged in marine insurance in London, or otherwise connected with shipping, having rooms in the London Royal Exchange. Members are admitted by subscription, and the affairs of the institution are conducted by a committee. Reports are received daily from all foreign ports, and this information is posted in the common or merchants' room. Besides this, there are other rooms for the use of the underwriters and for ship-auctions, a library, restaurant, etc. Lloyd's list, containing shipping reports, is published daily, and various other publications relating to shipping are also issued. Lloyd's Registry is an independent association for the classification of shipping according to character and efficiency. Lloyd's Register of Shipping is issued annually, and the society maintains a large staff of surveyers, who inspect and report upon vessels both when built and afterward. Originally the London underwriters met at Lloyd's Coffee-house, hence the name.

Lloyd's Bonds, in England, from 1850 to 1870 a well known commercial security; mostly instruments under the seal of a railway or other such company admitting the indebtedness of the company to a specified amount, with a covenant to pay such amount with interest within a stated time. These companies had generally statutory authority to borrow only when a certain amount (usually the whole) of their capital had been subscribed and a specified portion paid up; their power of borrowing must also be exercised with the sanction of a general meeting. Such restrictions were severely felt by companies whose works were being constructed. A barrister, J. H. Lloyd, relieved the companies from this embarrassment by taking advantage of the fact that companies, though prevented in such cases from borrowing, could contract debts in any other way, and acknowledge their obligations in various forms. He introduced a form in which such acknowledgments would become almost as binding on the grantors as a statutory debenture, and so become sufficiently marketable.

Load Line, a line drawn upon the side of a ship to indicate when she is properly loaded, or if overloaded. This is quite essential, as many vessels are lost at sea, the result of overloading. The abbreviations used in designating the load line are as follows:

FW.,	fresh water load-line (steamer).
IS.,	summer load-line, Indian Ocean.
S.,	summer.
W.,	winter.
WNA.,	winter, north Atlantic.
F.,	fresh water sailing ships.

These marks are painted on iron or steel ships, and cut into the wood on wooden vessels.

Loadstar. See LODESTAR.

Loan, anything lent or given to another on condition of return or payment. In law loans are considered to be of two kinds — *mutuum* and *commodate;* the former term being applied to the loan of such articles as are consumed in the use, as provisions or money; the latter to the loan of such articles as must be individually returned to the lender. The acknowledgment of a loan of money may be made by giving a bond, a promissory note, or an I. O. U. (q.v.).

Lobachevsky, or **Lobatchewsky, Nicolas Ivanovitch,** Russian mathematician: b. Makareif, Nyni-Novgorod, 1793; d. 24 Feb. 1856. He entered the University of Kazañ in 1807, completed his course of study in 5 years, became assistant professor of mathematics in 1814, and extraordinary professor in 1816. In 1823 he became ordinary professor and retained the chair until 1846, when he fell into disfavor. Unlike many professional men, he was a good business man and his administration of the affairs of the university was marked by many beneficial changes. He organized the force of teachers, and even studied architecture, so that when the new buildings were erected he supervised their erection, economized space and saved thousands of dollars. He wrote his Pangéometrie in 1855, giving the result of his long years of geometrical studies and presented it to the university. He was one of the first thinkers to apply a critical treatment to the Euclidean principles of geometry. He gave his first contribution to the theory of hyper-geometry in a lecture at Kazañ in 1826, but later wrote several treatises on the subject. He also wrote a treatise on Algebra (Kazañ 1834) and contributed many other articles on mathematics. His complete works were edited by Janischevsky (1870) and have been translated by several writers. His collection of geometrical writings was published in Lanzañ in 1883, the first volume containing Russian articles only, and the second and last volume containing the French and German articles. For his geometry consult: 'New Principles of Geometry with Complete Theory of Parallels,' translated by Halsted (Austin, Texas, 1897).

Lobby, The, a class of persons who seek to influence legislation outside of the regular legislature. The term was originally applied to the waiting-rooms of legislative halls, and then to those persons who frequented these rooms for the purpose of interviewing legislators with a view to influencing their votes. The lobby includes both those who are regularly employed in the work, and those who on particular occasions wish to promote or oppose some specific legislation. All large corporations and firms have regular paid lobbyists at Washington and at State capitals where legislation is likely to affect their interests. Women as well as men are employed as lobbyists, and are said to be very successful. The lobby is not in theory, nor necessarily in practice, a corrupting agency. It may furnish an entirely legitimate and desirable method of giving legislators necessary information in regard to certain laws; but it may also be, and often is, the means of obtaining legislation in the interests of a few without regard to the public good. The methods of the lobby differ with the character of the lobbyist and of the legislator approached. They vary from the legitimate presentation of facts and argument in regard to a law to the use of bribery, threats of preventing re-election, etc.; and include the obtaining of letters and petitions from constituents, the employment of press articles, and social attentions. The successful lobbyist must thoroughly understand the men with whom he has to deal and the methods of legislation; it has been found, therefore, that former members of the legislature make the most successful and sometimes the most dangerous lobbyists. The dangers of the lobby are due to three chief causes: (1) the large number of special and private bills, all of which can not be fully considered at the regular sessions; (2) the system of referring all bills to committees, and accepting, as a rule, the report of the committee, so that the lobbyist has practically but few men to deal with; (3) the secrecy which attends the work of the lobby, giving the public no effective means of knowing or dealing with its evils. To oppose the grosser evils of the lobby both Federal and State laws attach heavy penalties to giving or taking a bribe for legislation. Many of the States also have lessened the number of bills to be presented by forbidding in their constitutions the passing of special acts in certain cases. Massachusetts has sought to lessen the secrecy by requiring every promoter of a law in the interest of others to be registered, with the name and address of his employer and a statement of the matter on which he is employed. This law has had the effect of giving legal sanction to the lobbyist's work, improving the character of the lobbyists, and of lessening, though not entirely preventing, the evils attending secrecy.

Consult: Bryce, ‹American Commonwealth›; Bridgman, ‹The Lobby› (in ‹New England Magazine,› n. s. Vol. XVI., p. 151); Tanner, ‹The Lobby and Public Men.›

Lobe'lia, a genus of annual and perennial herbs and a few sub-shrubs of the order Lobeliaceæ, closely allied to the harebells. More than 200 species are distributed throughout the temperate and tropical zones, especially in damp soils. They are characterized by alternate, usually narrow leaves and two-lipped tubular flowers (three petals forming one lip and two the other), arranged in terminal racemes. Several of the species are highly prized as garden plants, the best known being the cardinal-flower (q.v.), the great lobelia (*L. syphilatica*), both common natives in marshy grounds and along streams; *L. erinus,* a favorite African plant for edging flower beds; and *L. fulgens,* a Mexican species, which like the first named has brilliant red flowers. The other two generally have blue blossoms. They are all of simplest culture. Some species have been used in medicine, and one common species, *L. inflata,* is called Indian tobacco because its dried leaves were extensively smoked by the southern Indians, who enjoyed the narcotic effect in spite of the bitter flavor. Lobelin, lobelacrin and lobelic acid are organic derivatives.

Lobengula, lō-bĕng-goo'lă, king of the Matabeles (see Matabeleland): b. about 1833; d. 1894. He was a son of Mosilikatse, whom he succeeded in 1870. Fixing his capital at Bulawayo (q.v.), he made himself a powerful opponent of Western civilization, and prohibited his people, on pain of death, from accepting Christianity. After years of diplomatic effort, following the discovery of gold in his domains, Great Britain, by treaty in 1888, acquired suzerainty over his kingdom, and in 1890 the British South African Company obtained from him permission to settle in Mashonaland (q.v.), paying him a stipulated rent. After preparing to hold the country and work the gold mines, the company provoked the enmity of Lobengula, who began against the English a war which resulted in his disastrous defeat, after shocking slaughter of his men by Maxim guns. Bulawayo was taken, and Lobengula fled. During his flight he ambuscaded and killed Maj. Wilson and a British detachment, but the contest ended with his own death.

Lob'lolly Bay, or **Tan Bay,** an elegant pyramidal shrub or tree (*Gordonia lasianthus*) of the tea family, which covers considerable tracts of swampy coast along the Gulf of Mexico. It is a handsome tree, sometimes 50 or 60 feet tall, with evergreen leaves and large white fragrant flowers. Its bark is used in tanning.

Loboc, lō-bŏk', Philippines, a pueblo of the province of Bohol, situated in the southern part of the province on the Socar-Vilar-Loay River, three miles from its outlet, and 12 miles east of Tagbilaran, the provincial capital. It is on the road leading from the coast. Pop. 10,200.

Lobos, lō'bōs, or **Seal Islands,** Peru, three islands in the Pacific, 12 miles from the mainland, so named from the Spanish *lobo,* "seal," large numbers frequenting the islands. They were famous for their extensive deposits of guano, which have been depleted.

Lob'ster, the name of certain large crustaceans of the crab group, and especially of the genera *Homarus, Nephrops,* and *Palinurus.* To the first belong the common European and American lobsters (*Homarus gammarus* and *americanus*). *Nephrops* differs chiefly in possessing 19, instead of 20, pairs of gills, and its most important species is the Norwegian lobster (*N. norvegicus*). To *Palinurus* belongs the rock-lobster or marine crayfish (*P. vulgaris*) of Europe, as well as some tropical species, all of which differ from the common lobster in the absence of the large claws, while they possess long rigid antennæ and spiny shells. A large and handsome species of this group is abundant in West Indian waters.

The American lobster is found along the western Atlantic coast from Delaware to Labrador; from the shore to a depth of 100 fathoms. It is most abundant on the shores of Maine and Nova Scotia and uncommon on the New Jersey coast. Though living amid a variety of surroundings, the lobster prefers rocky bottoms, on which it reaches the greatest size and abundance, probably a direct result of a more plentiful food supply. Like many fishes, but to a much less degree, the lobster is migratory, moving into shallow water in the spring and returning to greater depths as the water grows colder in the fall. This habit, however, is very far from being universal and many lobsters remain in shallow waters throughout the year. The food of the lobster consists of all kinds of animals, both living and dead, and to a less extent of vegetable matter, the indigestible parts of which are regurgitated. At times they are cannibalistic. Although so well protected by their hard shells, powerful claws, and burrowing habits, lobsters have many enemies besides man. The most important of these are bottom-feeding fishes, such as the cod, tautog, skate and dogfish, which destroy great numbers of young lobsters when 2 to 6 inches long, as well as the egg-bearing females and moulting adults. During the free-swimming larval stages great numbers probably fall a prey to surface-feeding fishes like the menhaden and herring, though little direct proof of this exists. The number of eggs produced by a female lobster varies from 3,000 to nearly 100,000, according to the size and age of the animal, maturity being attained at an age of 3 or 4 years and a length of about 8 to 12 inches. The great majority (about four fifths) lay their eggs during the summer, the remainder during the fall and winter, and it is probable that each female lays once in two years. After extrusion the eggs are borne on the appendages attached to the lower side of the abdomen or tail of the female, where they remain undergoing a slow development for 10 or 11 months, most of those laid during the summer hatching in June of the following year. After hatching, the young passes a period of 6 to 8 weeks as a free-swimming pelagic larva, which moults 5 or 6 times, with corresponding changes in form and color. By this time it has assumed the form of the adult and is about three fourths of an inch long. It now sinks to the bottom and burrows into the gravel or hides in rock crevices near shore. At the end of the first year it is about 4 or 5 inches long and has moulted from 14 to 17 times, after which growth is much less rapid and moulting less frequent. The rate of growth varies greatly according to the food supply and other conditions, but a lobster of 10 or 12 inches is about 5 years old. A great age and size are sometimes attained, individuals weighing upward of 40 pounds being recorded, though even 25 pounds is very rarely reached.

The toothsomeness of the American lobster was early recognized and a regular fishery has existed on the Massachusetts coast for nearly a century. Owing to a rapidly extending depletion of the fishing-grounds and a consequent diminution in the size and number of lobsters, the centre of the fishery has shifted northward, first to Maine and then to the British provinces. The lobster fisheries of the United States in 1901 employed 4,348 persons, 4,151 vessels and boats and 208,563 lobster-pots, representing an investment of $1,668,060, nearly three fifths of which is credited to Maine. The yield was 15,767,741 pounds, valued at $1,390,579, of which 12,346,450 pounds were taken in Maine. After about 1885 the yield declined steadily, but the value of the product increased. As measures toward maintaining the lobster supply, laws have been enacted fixing fines for the possession of egg-bearing lobsters or those below a specified minimum size, and recourse has been had to artificial propagation. In the latter practice many millions of eggs are annually taken from the bearing lobsters, artificially hatched, and the larvæ distributed by the fish commissions of the United States and the British Provinces. In 1902 our Bureau planted upward of 81,000,000 of fry, and the Canadian government operates on an even more extensive scale. The beneficial results have been scarcely apparent, but the recent successful rearing of lobsters beyond the larval stages has introduced a more hopeful outlook. The methods of the lobster fishery are very simple and uniform. Use is made of a trap or pot, a box-like affair generally made of laths placed about one inch apart, and with a funnel-shaped opening of coarse netting placed in one end. The pot is baited with otherwise useless fish, weighted with stones, and lowered to the bottom by means of a rope to the upper end of which a buoy, with the owner's private mark affixed, is attached. The pots are visited daily, and the lobsters, which after entering are unable to find their way out, removed. They are kept alive in floats until a sufficient number for shipment has been gathered. Besides those sold in the shells, large quantities of the meat are canned, particularly at Portland.

Consult especially the elaborate account of the American lobster by Herrick, in ‹Bulletin of the U. S. Fish Commission› for 1895, in which full bibliographical references will be found.

Lob'worm. See Lugworm.

Local Government. See Municipal Government.

Local Option, or local control of the liquor traffic; a term applied to the principle by which a certain majority of the inhabitants or taxpayers of a certain locality, town, county or State, may decide as to whether any, or how many, places for the sale of intoxicating liquors shall exist in the locality. What considerations should determine a locality, who should be the constituents, what should be the majority necessary to vote the abolition of licenses, and whether the trade thus affected should receive compensation or not, are points not as yet satisfactorily settled. This principle operates in several localities in the United States with varying success from the prohibition or temperance point of view. Local option in the States of Maine and Kansas has resulted in restricted laws governing the liquor traffic. Many small towns and villages have adopted local option with more or less satisfactory results. The words «local option» had their origin with the temperance reformers who have sought to secure power and authority enabling them to regulate the liquor traffic, either by maintaining unchanged, increasing, diminishing, or wholly suppressing the houses for the sale of intoxicating liquors.

Loch Lomond. See Lomond, Loch.

Lochleven. See Leven, Loch.

Lock, a mechanical appliance used for fastening doors, chests, etc., generally opened by a key. The lock is reckoned the masterpiece in smithery, a great deal of art and delicacy being required in contriving and varying the wards, springs, bolts, etc., and adjusting them to the places where they are to be used, and to the several occasions of using them. The principle on which all locks depend is the application of a lever to an interior bolt, by means of a communication from without; so that, by means of the latter, the lever acts upon the bolt, and moves it in such a manner as to secure the lid or door from being opened by any pull or push from without. The security of locks in general, therefore, depends on the number of impediments we can interpose betwixt the lever (the key) and the bolt which secures the door; and these impediments are well known by the name of wards (which slip into corresponding grooves of the key), the number and intricacy of which are supposed to distinguish a good lock from a bad one. If these wards, however, do not in an effectual manner preclude the access of all other instruments besides the proper key, it is still possible for a mechanic of equal skill with the lockmaker to open it without the key, and thus to elude the labor of the other. Another kind of impediment is the tumbler, which is a small projecting piece of metal carried on a latch, and which rests in a notch cut in the bolt, and can only be raised by application of the proper key. Various complicated and difficult locks have been constructed. In a very ingenious lock, invented in England, 24 small blocks of metal, of different sizes, are introduced, corresponding to the letters of the alphabet. Out of these an indefinite number of combinations may be made. The person locking the door selects and places the blocks necessary to spell a particular word, known only to himself; the act of locking or throwing out the bolt produces the particular arrangements in the internal parts of the lock, and no other person, even if in possession of the key, can open the door without a knowledge of the same word.

The padlock, in which the lock is a separate arrangement, is precisely similar to other locks except in shape. It has also a movable bow which is hooked into a staple or other fastening and then locked. Locks for drawers, cupboards, and the like, which only require to be opened on one side, are generally made with a central pin on which the key, with a pipe, works; but in locks which must be opened from both sides this arrangement is impossible, and the key is solid, working through a hole in the lock. It must, however, be symmetrical, so as to exactly reach the turning place of the lock from either side. Locks which are mortised into the thickness of the door are called mortise locks. Many ingenious automatic latches have been invented for cabinets and the like, which shut of themselves when the door is closed, and can be pulled open without a key or turning a handle; they are used when security is not required, only a means of keeping the door closed.

For Lock in firearms, see MUSKET; REVOLVER; RIFLE.

Lock Haven, Pa., city, county-seat of Clinton County; on the Susquehanna River and on branches of the Beech Creek and the Pennsylvania R.R.'s; about 68 miles northwest of Harrisburg. The first settlement was made in 1769 and, in 1833, it was incorporated as a town. In 1844 it was made a borough, and in 1870 received its city charter. It is situated in an agricultural and lumbering region. Its chief industrial establishments are lumber and planing-mills, tanneries, cigar-box factory, cigar factory, foundries, sewer-pipe works, fire-brick works, silk-mill, breweries, paper-mill, and furniture factory. The State Central Normal School is situated here. Some of the prominent buildings are the court-house, a hospital, and several of the churches. The city has a circulating library containing about 6,000 volumes. Pop. (1900) 7,210.

Locke, lŏk, **David Ross** («PETROLEUM V. NASBY»), American humorist and satirist: b. Vestal, Broome County, N. Y., 20 Sept. 1833; d. Toledo, Ohio, 15 Feb. 1888. He learned the trade of printer and after being connected with several newspapers was editor and owner of the Toledo *Blade* in 1865, and very soon became popular as a humorous writer and later as a lecturer. He began his «Nasby» letters in the Findlay 'Jeffersonian' in 1860 and continued them throughout the Civil War. They exercised much influence in molding popular opinion, upholding as they did the policy of the Lincoln administration. In later years the satire of the letters, which still continued to appear, was aimed at President Johnson and his peculiar methods. They were collected and published in book form under the titles 'Divers Views, Opinions, and Prophecies of Yours Truly' (1865); 'Swingin' Round the Kirkle' (1866); 'Ekkoes from Kentucky' (1867); 'The Struggles — Social, Financial, and Political — of P. V. Nasby' (1872). He also published 'Hannah Jane'; 'The Moral History of America's Life Struggle'; 'The Morals of Abou Ben Adhem.'

Locke, John, English philosopher: b. Wrington, Somerset, 29 Aug. 1632; d. Oates, Essex, 28 Oct. 1704. He was the son of an attorney who was also a captain in the Parliamentary army. Locke was educated at Westminster School and at Christ Church, Oxford, where he was graduated and took his bachelor's degree in 1656, two years later took the degree of M. A., and entered upon the study of medicine. He lectured at Oxford (1661–4) on Greek, rhetoric, and philosophy, and during this period became interested in experimental physics, especially chemistry and meteorology, and in metaphysics showed a preference for studying Descartes, although his own philosophy powerfully antagonizes that of the French master. Theology and politics, including diplomacy, also engaged his attention. At Oxford before 1666 he is said to have practised medicine, in which, however, he was never graduated. As secretary to Sir Walter Vane, British envoy, he went in 1665 to Cleves, Prussia, returning to Oxford in the following year, during which time he made the acquaintance of Lord Ashley, afterward 1st Earl of Shaftesbury, became his family physician and secretary, under his patronage held various offices, and in 1682 accompanied him in his retirement to Holland. Locke continued to reside abroad until 1689, when the revolution had been accomplished, then returned to become commissioner of appeals. His association with Lord Ashley, between whom and himself there was close intellectual sympathy, was stimulating to his genius, and it was in Ashley's house that Locke first planned the 'Essay on the Human Understanding.' Fully elaborating this work during his voluntary exile, he published it in complete form in 1690, with a dedication to the Earl of Pembroke, whose acquaintance he had made at Montpellier many years before. The 'Essay,' which had largely occupied him for almost 20 years, met with much objection in England, being particularly opposed at Oxford; but on the Continent it brought him great celebrity, and was translated into French and Latin, and later into other languages. For the copyright of the first edition he received but £30, and although he had previously published two works this was the first to bear the author's name. In 1695 Locke was made a commissioner of trade and plantations, but in a few years became incapacitated and retired, and from 1700 until his death lived with his friend, Sir F. Masham, at Oates. Meanwhile being drawn into the violent controversies over the essay which arose among different sects and schools, he had sturdily maintained his ground in a style of epistolary polemics which still possesses an academic interest.

As a philosopher Locke's place is usually fixed at the head of the English Sensational School, although this classification by no means does justice to his many-sidedness as a thinker, and the term «sensationalism,» with its ordinary connotations, is wholly inadequate for a correct representation either of his speculative inquiries or of those still less definable meditations which led him profoundly to search the realms of ethics and of spiritual laws, in an endeavor to assign the relations and functions of these in the world of practical politics and that of instituted religion. Of that sensationalist school of which he is reputed to have been founder, it has been said with much pertinence that its ultimate conclusions are such as «his calm and pious mind would have indignantly repudiated.» The 'Essay on the Human Understanding' holds a permanent place among the greater works of philosophy, in the history of which, however, Locke's method may be superseded, and although his main doctrine be exploded, the book retains its importance as an epoch-marking achievement. It seeks the primal sources and the scope of human knowledge, denying the existence of innate ideas, presenting the mind as a sheet of white paper prepared to be written upon by experience, which alone supplies the knowledge there impressed, and tracing the sources of all ideas to what he calls sensation and reflection. This doctrine of the *tabula rasa* or white paper found a vigorous controverter in Leibnitz (q.v.). The opposition which Locke thus represented between all intuitional and experiential philosophies still remains a central point of dispute among thinkers of various schools, but he was a forerunner in psychology, as he was also in the advocacy of civil and religious liberty, for which he suffered persecution and betook himself to exile.

Upon questions of government Locke was in the main a follower of Hobbes (q.v.) in so far as the latter regarded governmental authority as something delegated by the subjects for the creation of the state, through a compact which carried in itself the principle of obligation. But he went far beyond Hobbes in the application of his views to the concrete affairs of politics. In 1689 a constitution for the Carolina colonists was drafted by him, and was an evidence of his concern to put political philosophy to practical service. Besides the 'Essay,' his works include letters 'Concerning Toleration' (1689); 'Two Treatises on Government' (1690); 'Some Thoughts Concerning Education' (1693); 'The Reasonableness of Christianity'; and a little book 'On the Conduct of the Understanding,' posthumously published. Frazer's edition of the 'Essay' (1894) is the most desirable. His philosophical writings have been published in various editions, Saint John's (1854 et seq.) being one of the most useful. Consult: King, 'The Life of John Locke' (1829); Fox Bourne, 'The Life of John Locke' (1876); Fowler, 'John Locke' (1880); Frazer, 'Locke' (1890); Russell, 'The Philosophy of Locke' (1891); and Ueberweg-Heinze, 'Grundriss der Geschichte der Philosophie' (8th ed., 1896), where a more extended bibliography is to be found.

Locke, William John, English novelist: b. 20 March 1863. He was educated at Queen's Royal College, Trinidad, and Cambridge University, and is now (1903) secretary of the Royal Institute of British Architects. His fictions include 'At the Gate of Samaria' (1895); 'The Demagogue and Lady Phayre' (1896); 'A Study in Shadows' (1896); 'Derelicts' (1897); 'Idols' (1898); 'The White Dove' (1900); 'The Usurper.' These have been reissued in the United States. He has also written two plays, 'Mr. Cynic,' played in 1899, and 'The Lost Legion' (1900).

Lock'er-Lamp'son, Frederick, English lyric poet: b. Greenwich 29 May 1821; d. Rowfant, England, 30 May 1895. He wrote a volume of «society verses» greatly admired for their grace and finish, 'London Lyrics' (1857); edited an anthology, 'Lyra Elegantiarum' (1867); and wrote a collection of miscellanies entitled 'Patchwork' (1879). In 1874 he married for his second wife the daughter of Sir Curtis Lampson and took her name in addition to his own. Consult 'My Confidences,' his autobiography (1896).

Lockhart, lŏk'ärt, **John Gibson,** Scottish editor and biographer: b. Cambusnethan, Lanarkshire, 14 July 1794; d. Abbotsford 25 Nov. 1854. He was graduated at Glasgow and Oxford universities and became a member of the Scottish bar. He never practised as an advocate, but devoted his time to literary pursuits. In 1817, with Professor Wilson, he established 'Blackwood's Magazine,' a Tory organ, which at the outset created an immense sensation by the ability and keen satire displayed in many of its articles. In 1820 Lockhart, who had previously become a favorite with Sir Walter Scott, married his eldest daughter, and much of his future life took its color from this connection. In 1826 he succeeded Gifford in the editorship of the 'Quarterly Review,' and continued in the position till 1853. His translations of 'Spanish Ballads,' originally contributed to 'Blackwood,' were collected in 1823. He also published the novel 'Valerius' (1821); 'Reginald Dalton' (1823); 'Adam Blair' (1822); and 'Matthew Wald' (1824); 'Life of Robert Burns' (1828); 'Life of Sir Walter Scott' (1839–41). This last, though indebted for much of its interest to its subject, is on the whole written, notwithstanding occasional prolixity, with taste and judgment. Lockhart, for his steady attachment and important services to the Conservative party, was rewarded in 1843, by Sir Robert Peel, with the appointment of auditor of the duchy of Lancaster. He was buried in Dryburgh Abbey, close by Sir Walter Scott. Consult: Lang, 'Life of John Gibson Lockhart' (1896).

Lockhart, lŏk'härt, Texas, town, county-seat of Caldwell County; on the Missouri, K. & T., and the San Antonio & A. P. R.R.'s; about 28 miles south of Austin and 140 miles west of Houston. It is situated in a fertile agricultural section in which cotton and live-stock are raised extensively. Some of its industrial establishments are a soap-factory, cotton-gins, cottonseed-oil mill, wagon and carriage factory, cotton-compress, stock-yards, grain-elevators, and lumber-yards. Pop. (1900) 2,306.

Lockjaw. See Tetanus.

Lock'out, the discharge and keeping out of employment of artisans and laborers by their employers. It is a retaliatory measure adopted by some capitalists to resist the demands for shorter hours, more pay, etc., made by their workmen. The workmen may themselves be responsible for a lockout, just as an employer may be responsible for a strike upon the part of his workmen. See also Strikes.

Lock'port, N. Y., city, county-seat of Niagara County; on the Erie Canal, and on the Erie, the Buffalo & L., and the New York C. R.R.'s; 12 miles from Lake Ontario, 20 miles east of Niagara Falls, and about 25 miles north by east of Buffalo. It was settled in 1823 by workmen who were employed on the Erie Canal. On 26 March 1829 it was incorporated as a village, and became a city 11 April 1865. It is situated in a fertile agricultural region; but the extensive water-power obtained from the canal has made it an important manufacturing city. The 10 large locks of the canal, which here make a descent of 66 feet, have given name to the city. The canal passes through a deep cut, an excavation in the solid rock, several miles in length. The New York Central Railroad bridge, 500 feet long, crosses the canal here, at a height of 60 feet above water. There are large sandstone and limestone quarries in the vicinity.

The chief manufactures are pulp and paper, Holly waterworks machinery, wood-work machinery, machinery for flour mills, glass, rolling-mill products, cotton-batting, wagons and carriages, brooms, flour, indurated fibre, aluminum, cotton and woolen goods, and creamery products. Lockport has 20 large manufacturing establishments, which have nearly 12,000 employees. In addition to the trade in manufactured articles, the city has an extensive trade in the quarry products, and in grain and fruits. It has (1903) four banks, with a combined capital of $3,500,000. Some of the prominent buildings are the high school, the new government building, and the court-house. It has 19 churches and good public and parish schools. It is the seat of Saint Joseph's Academy. The city owns and operates the waterworks. The government is vested in a mayor and a council of 10 members, elected annually. Pop. (1900) 16,581. Consult Pool, 'Landmarks of Niagara County.'

T. T. Feeley,
Editor 'Review.'

Lockroy, Edouard Etienne Antoine Simon, ā-doo-är ā-tē-ĕn äṅ-twän sē-môṅ lŏk-rwä, French journalist: b. Paris, France, 18 July 1838. He took part in Garibaldi's Sicilian expedition and was prominent as a journalist before and after the war with Germany. On account of his radical articles published in 'Figaro,' 'Le Rappel,' and 'Le Peuple Souverain,' — a popular political journal, of which he was editor,— he was imprisoned for a few months in 1872 and again in 1873. He entered the Assembly in 1873, there voting with the extreme Left. He was minister of commerce (1886–7), and of public instruction (1888). His published volumes of collected newspaper articles include: 'The Eagles of the Capitol' (1869); 'Down with Progress' (1870); 'The Commune and the Assembly' (1871); 'The Rebel Island' (1877); 'Von Moltke' (1891), memoirs; 'A Mission in the Vendée, 1793' (1893).

Locks, Canal. See Canals.

Locks'ley Hall, a well-known poem by Lord Alfred Tennyson (q.v.), first published in 1842.

Lock'wood, Belva Ann Bennett, American lawyer and reformer: b. Royalton, N. Y., 24 Oct. 1830. She was graduated from Genessee College, Lima, N. Y., in 1857, and taught school 1857–68. She was married in 1848 to Uriah H. McNall (d. 1853), and in 1868 to Dr. Ezekiel Lockwood. She studied law at Washington, and was admitted to the bar in the District of Columbia in 1873. Before that time she had secured the passage of a bill giving women employees of the government equal pay for equal work; in 1879 she obtained the passage of a bill permitting women to practise before the United States Supreme Court, and was admitted under this law in the same year. She has been engaged in many important law cases, some before the Supreme Court, and was one of the attorneys in the probate of the will of Myra Clarke Gaines. She has also been active in temperance, peace, and woman suffrage movements; has been secretary of the American branch of the International Peace Bureau; and in 1884 and 1888 was the nominee of the Equal Rights Party for President of the United States. In 1896 she was commissioned by the Secretary of State to represent the United States at the Congress of Charities and Corrections in Geneva, Switzerland; in 1901 she was elected president of the Women's National Press Association. She has for several years been interested in the claims of the North Carolina Cherokee Indians, and in 1900 had a bill before Congress to prevent encroachment upon their territory. She also prepared an amendment to the Statehood Bill before Congress in 1903, granting suffrage to women in Oklahoma, Arizona, and New Mexico.

Lockwood, Henry Hayes, American soldier, tactician, and educator: b. Kent County, Del., 17 Aug. 1814; d. Washington, D. C., 7 Dec. 1899. He was graduated from West Point in 1836, served as lieutenant of the 2d artillery in the Seminole war in Florida (1837), resigned from the army and undertook agriculture in Delaware. In 1841 he became professor of mathematics in the United States navy, in 1845 of natural philosophy at the Naval Academy, where he was professor of artillery and infantry tactis in 1845–61, and of astronomy and gunnery in 1851–61. He entered the Civil War as colonel of the 1st Delaware infantry, on 8 Aug. 1861 was promoted brigadier-general of volunteers, at Gettysburg commanded a brigade of the Twelfth corps, and in 1863–4 was commander of the Middle Department. Subsequent to the war he was professor of natural philosophy at the Naval Academy, and in 1871–6 was connected with the Naval observatory. He published 'A Manual for Naval Batteries' (1852), and 'Exercises in Small Arms and Field Artillery, arranged for Naval Service' (1852).

Lockwood, Ingersoll, American author: b. New York 1841. Besides such works for juvenile readers as 'The Travels of Little Baron Trump'; 'Wonderful Deeds of Little Giant Roab'; 'Extraordinary Experiments of Little Captain Doppelkopp'; and 'Baron Trump's Journey Underground,' he has written 'Legal Don'ts'; 'Private Letters of a French Woman'; etc.

Lockwood, James Booth, American soldier and Arctic explorer: b. Annapolis, Md., 9 Oct. 1852; d. Cape Sabine, 9 April 1884. He entered the army as 2d lieutenant in 1873, and served till 1880 in the West. He volunteered to accompany the Lady Franklin Bay expedition to the Arctic regions and was made second in command. His fame rests on the discovery of Lockwood Island, in lat. 83° 24' N., the farthest northern point of land or sea up to that time. His body was brought to the United States and interred in the grounds of the Naval Academy. Consult Lanman, 'Farthest North' (1885).

Lockyer, lŏk'yėr, Sir **Joseph Norman,** English astronomer: b. Rugby 17 May 1836. He was educated privately, entered the War Office in 1857, and in 1870 was appointed secretary of the royal commission on the advancement of science. Five years later he became astronomical lecturer at South Kensington, and since 1881 has been professor of astronomical physics in the Royal College of Science. He directed the eclipse expedition to Sicily in 1870, and to India in 1871, and he subsequently directed many others, including those of 1896 and 1897. In 1874 he was awarded the Rumford medal of the Royal Society, and became editor of 'Nature,' a post which he still holds, and was knighted in

1897. He is best known as a popular lecturer on science, and in connection with his discoveries in spectrum analysis. He has published: ‘Elementary Lessons in Astronomy’ (1870); ‘Contributions to Solar Physics’ (1873); ‘The Spectroscope’ (1873); ‘Primer of Astronomy’ (1874); ‘Studies in Spectrum Analysis’ (1878); ‘Star-Gazing’ (1878); ‘Chemistry of the Sun’ (1887); ‘The Movements of the Earth’ (1887); ‘The Meteoritic Hypothesis’ (1890); ‘The Dawn of Astronomy’ (1894); ‘The Sun's Place in Nature’ (1897); ‘Recent and Coming Eclipses’ (1897); ‘Inorganic Evolution’ (1900).

Loco-Fo'cos, in United States history, a political nickname applied to the equal rights or radical faction, 1835–7, of the Democratic party, properly of New York, though the name was afterward made national. During the Federalist control of the government, the method of granting bank charters and controlling banks was charged by the opposing faction with favoritism and corruption. Upon their gaining control, things did not, in the opinion of many, improve; and in 1835 there was formed in New York the «Equal Rights party,» opposed to special privileges in granting bank charters to corporations. At a meeting in Tammany Hall, 29 Oct. 1835, the regular Tammany Democrats tried to gain control. Finding themselves outnumbered they turned out the lights and retired. The Equal Rights men produced candles and «loco-foco» matches, and continued the meeting. Hence the name. This party was beaten at the elections, but nevertheless exercised considerable influence in national affairs for several years. For a time the name was shortened into «locos.»

Lo'co-weed, or Loco-vetch. See Crazy Weed.

Locomo'tion, Animal. See Flight; Swimming.

Locomotive, The. Although there were numerous predictions and suggestions of steam-propelled carriages, notably those of Sir Isaac Newton in 1680 and of others, the first locomotive that deserves the name was that of Richard Trevithick in 1803. True, Cugnot made a steam-driven road wagon in 1769 and Murdock in 1784, but Trevithick was without doubt the father of the locomotive. He found that plain wheels had sufficient adhesion and that cogs were unnecessary; he used high pressure steam; he turned the exhaust into the stack and on discovering its effect on the fire, called it the «blast pipe.» His first engine had four wheels, all drivers, 4 feet 6 inches in diameter. The boiler was 6 feet long and had a return flue, bringing the chimney or stack at the same end as the fire door. There was only one cylinder, but the length made up for two, as it was 8 inches in diameter by 54 inches long. Unfortunately circumstances prevented Trevithick from following up the development of the locomotive and as a consequence many of his ideas have been credited to others. Between Trevithick's engine and the Rocket (1829), which is sometimes called the first locomotive, men had not been idle by any means. Blenkinsop in 1812, Hedley with his Puffing Billy in 1813, Stephenson's Blucher in 1814, Oliver Evans in the same year and others make up the list.

In 1825 the first public railway was opened, the Stockton and Darlington Railway, and George Stephenson was engineer. Its first engine was the Locomotive which was built by Stephenson in 1825. He also built the Hope, Black Diamond, Diligence and Experiment in 1826. Timothy Hackworth's Royal George, a rebuilt engine, went into service in 1827, but none were entirely satisfactory, and a prize of $500 was offered in 1829 for the best engines. The Rocket, Novelty and Sanspareil entered and the Rocket won, although some claim this was due solely to the failure of the others, caused by poor work or material. This was the famous Rainhill trial which is so often quoted, and in which 29 miles per hour was made. The main dimensions of the Rocket were:

Cylinders, 8 x 16½.
One pair drivers, 3 ft. 8½ in.
Boiler, 3 ft. 4 in. diameter, by 6 ft. long.
Steam, 50 lbs.
Firebox, 3 by 2 ft.
Tubes, 23 three-inch.
Tubes H. S., 117.75.
Firebox, H. S., 20.
Total, H. S., 137.75.
Weight of engine, 4 tons 5 cwt.

This trial proved the success of the locomotive as a means of hauling loads, and this is probably the main reason that Stephenson has been given credit which belonged to others. In 1828 Horatio Allen went to England for the Delaware and Hudson Canal Co. and bought four locomotives, three from Foster, Rastrick & Co. and one from Stephenson. Stephenson's engine arrived first in January 18 9 and was called the America. It had cylinders 9 by 24 inches, a boiler 49 inches in diameter by 9 feet 6 inches long with two fire tubes 19 inches in diameter. The four drivers were 48 inches in diameter, and the cylinders were at an angle of 33 degrees to the horizontal. This engine had a kind of «bar frame.» Although the America arrived in the country first, it was not the first to run and for that reason the Stourbridge Lion, the first of the other three engines, is generally considered as the first engine in this country. This engine had cylinders 7½ by 36 inches. The boiler was 48 inches in diameter by 10 feet long. The reversing was accomplished by shifting eccentrics on the axle. From this date the United States began to take a hand in the development of the locomotive, and foremost at this time was the Baltimore & Ohio Railroad. On 4 Jan. 1831 they offered $4,000 for the best American engine of 3½ tons to pull 15 tons on a level at a 15-mile speed. It must burn anthracite coal, be on four wheels and run on 400 foot radius curves, steam not to exceed 100 pounds. Phineas Davis won the prize with the York, a vertical engine with four 30 inch wheels. Ross Winans was connected with the road as engineer and this experience doubtless aided the work he did in after years as a locomotive builder of no small fame. The «Bury» boiler came into existence in 1832 in the engine Caledonian for the Liverpool and Manchester Railway. In the same year, the Ironsides, Matthew Baldwin's first engine, was put into service in this country. This was the beginning of the Baldwin Locomotive Works, the largest in the world.

The first steam whistle on record came into existence about this time, 1833, and was placed on the engine Samson, one of Stephenson's make. It is credited to a Mr. Bagster of the Leicester and Swannington Railway, on whose lines it was used.

Large wheels began to be the fad and 7, 8 and even 9 foot drivers were built. The Liverpool was one of the famous Crampton engines with the drivers behind the firebox. The Cornwall was built by F. Trevithick in 1847 and had drivers 8 feet 6 inches in diameter. As originally built, this had the driving axle *above the boiler*. This was afterward changed and the engine was running the 45 minutes express between Manchester and Liverpool as late as 1897,—a remarkable length of service for a locomotive. This attained a speed of 79 miles an hour as early as 1851, while speeds of 75 miles were frequently reported. In 1853 the locomotive superintendent of the Bristol and Exeter Railway built a class of tank engines with 9 foot drivers, which seem to have capped the climax for large driving wheels. A speed of 81 miles an hour has been claimed for these engines and it is said the average consumption of coke was only 21¾ pounds per mile. The first locomotive in England to have a Giffard injector was Ramsbottom's Problem, which was built in November 1859.

Tractive Power.—Tractive power is another name for drawbar pull and shows the amount of horizontal effort exerted by a locomotive. It depends on the steam pressure, size of cylinders and diameter of drivers. The original formula or rule takes into account the area of both cylinders, circumference of wheel etc.; but this has been boiled down by cancellation to the following: Tractive power equals the square of cylinder diameter, times stroke in inches, times mean effective pressure per square inch, divided by the diameter of the driving wheel in inches. Put in the shape of a formula this is:

$$\text{Tractive power in pounds} = \frac{d^2 \times S \times P}{D}, \text{ where}$$

d = diameter of cylinder,
S = length of stroke in inches,
P = mean effective pressure.
D = diameter of driving wheel.

For tractive power calculations, the mean effective pressure is generally taken as 85 per cent of the boiler pressure.

Taking the case of an 18 by 24 inch engine, 68 inch drivers, 200 pounds of steam, and we have

$$\frac{18^2 \times 24 \times 170}{68} \text{ or}$$

$$\frac{324 \times 24 \times 170}{68} = 19{,}440 \text{ pounds,}$$

drawbar pull, not allowing for internal friction of engine.

An easy way of reckoning is to remember that the cylinder diameter squared, equals the tractive power for one inch stroke, one pound pressure and one inch driver. Thus in the case above, if the stroke had been one inch, pressure one pound and driver one inch, the tractive power would have been 324 pounds. The actual pressure and stroke are multiplied by this and of course divided by the diameter of drivers, also in inches. From this can be readily seen how the diameter affects the tractive power and why freight engines have small drivers. If one engine has 84 inch drivers and another only 42 inches, other dimensions being the same, the latter will pull twice as much at drawbar, which means that it will start a train of double the size as the first. These calculations do not allow for internal friction.

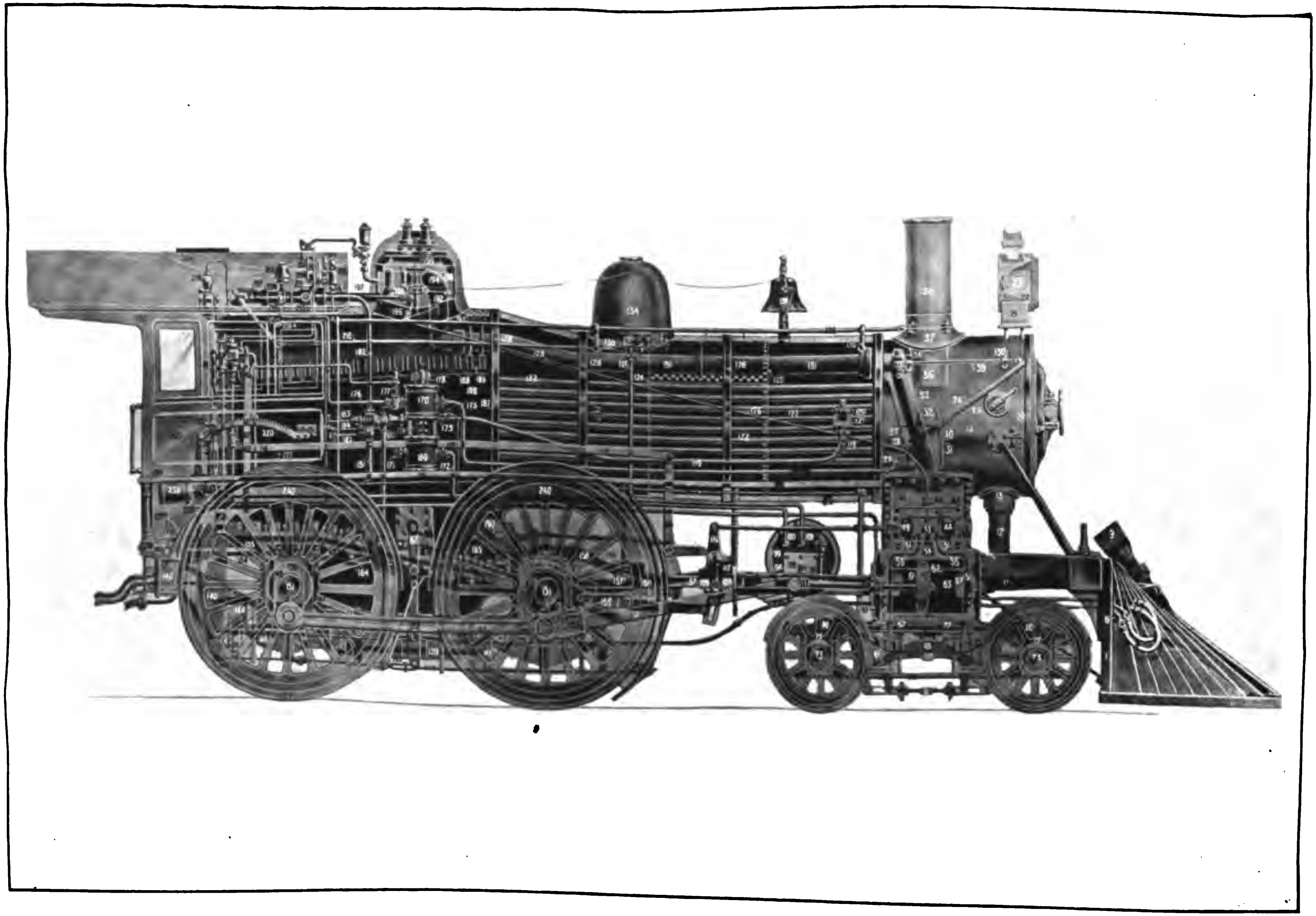
Driving Wheels.—The number of driving wheels depends on the work to be done. A fast passenger train with few stops is often handled by an engine having but one pair of drivers in Europe and in a few instances in the United States. While the engine may slip slightly on starting, the number of starts are few and there is no friction from side rods, as in coupled engines. Every pair of wheels coupled together means added friction of the side rods, but it also means a reduction of the chance of slipping at the start. A little thought will show that the main pair of drivers are the only ones really driving the engine, unless this pair tends or starts to slip. When this occurs the others take up their share of the work. As this only occurs at the start or on a heavy grade, the extra drivers are apt to be carrying wheels only, the greater part of the time, although the heavy trains now being hauled in freight service give nearly a maximum load to the engine. For an all around engine, the American or eight wheel engine still has the lead, although most modern freight engines have six and eight drivers, while some roads are using 10 wheel passenger locomotives; the great majority, however, are still eight wheelers. The question of weight on drivers is somewhat a disputed point, the generally accepted proportion being four times the maximum drawbar pull, that is, if the tractive power is 25,000 pounds, the weight on drivers should be at least 100,000 pounds. This is because it has been found that this ratio will hold an engine from slipping on a good dry rail. For poor or slipping rails sand is used unless the weight is sufficient, say six times the tractive power.

Although the number of driving wheels generally depends on the adhesion required, there are cases where light rails or poor roadbed prevent the necessary weight being put on the drivers needed for the work. In such cases more drivers are needed, more as carrying wheels than as drivers. In such cases, however, trailing or carrying wheels are used under the firebox. This is done on the Atlantic type of engine as well as on all single driver engines. The question of trucks under the front end seem to have been settled something as follows: Passenger engines on account of high speed, have a full truck to aid in rounding curves at speed. Freight or slow moving engines have a pony or half truck as in the mogul and consolidation engines. This gives the desired guiding of front end of engines and at the same time leaves nearly all the weight on drivers where it can do good work. In European countries freight or «goods» engines rarely have any trucks, all the weight being on the drivers, where it is effective for adhesion. This is possible on account of the roads being comparatively straight, but they would not do on our sharp curves on account of liability to derailment and wear of track.

Locomotive Types.—Classification was formerly accomplished by name only and as these varied somewhat in different parts of the country, the system caused some confusion. F. M. Whyte of the New York Central & Hudson River Railroad has devised a classification by numbers which is very simple, and which is being generally adopted. It consists of three parts to designate leading trucks, drivers and trailing trucks, each wheel counting one, thus 0-4-0

NAMES OF 240 PARTS OF A MODERN LOCOMOTIVE.

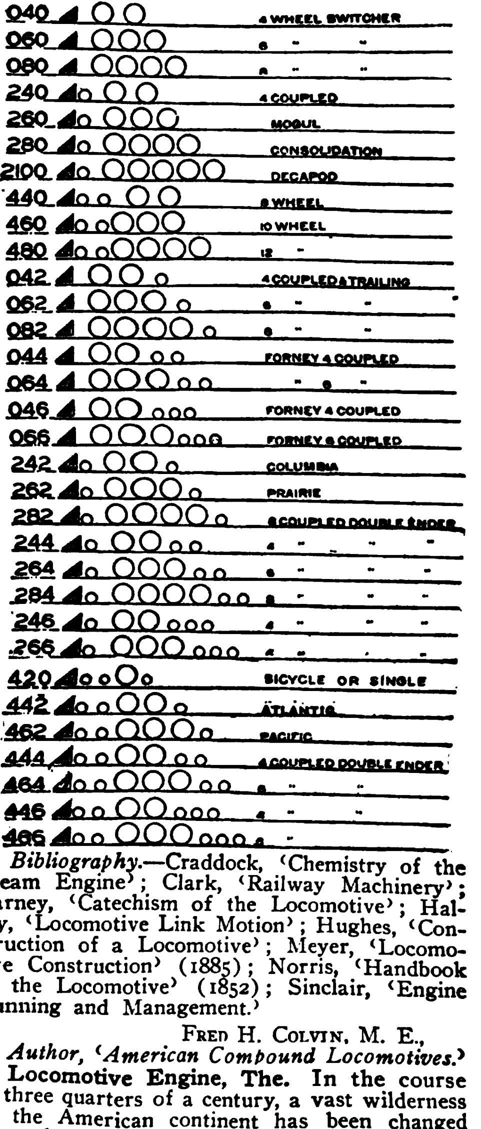
1. Pilot.
2. Draw Bar Plate.
3. Coupler.
4. Air Signal Hose.
5. Air Brake Hose.
6. Hose Hangers.
7. Batter Beam.
8. Pilot Bracket.
9. Flagstaff.
10. Arch Brace.
11. Front Frame.
12. Cinder Chute.
13. Cinder Chute Slide.
14. Extension Front.
15. Headlight Step.
16. Signal Lamp.
17. Number Plate.
18. Smoke Arch Door.
19. Smoke Arch Front.
20. Smoke Arch Ring.
21. Headlight Bracket.
22. Headlight Case.
23. Headlight Reflector.
24. Headlight Burner.
25. Cleaning Door.
26. Netting.
27. Deflector Plate.
28. Deflector Plate Adjuster.
29. Air Pump Exhaust Pipe.
30. Blower.
31. Nozzle Stand.
32. Nozzle Tip.
33. Steam Pipe. (2.)
34. T or Nigger Head.
35. Dry Pipe Joint.
36. Petticoat or Draft Pipe.
37. Stack Base.
38. Smoke Stack.
39. Arch Hand Rail.
40. Oil Pipe Plug.
41. Cylinder Saddle.
42. Steam Chest Casing Cover.
43. Steam Chest Cover.
44. Steam Chest.
45. Relief Valve.
46. Balance Plate.
47. Balanced Slide Valve.
48. Valve Yoke.
49. Valve Stem.
50. Valve Stem Packing.
51. Valve Stem Connection.
52. Valve Seat.
53. Bridges.
54. Exhaust Port.
55. Front Train Line Cock.
56. Steam Ports.
57. Cylinder.
58. Back Cylinder-Head.
59. Piston Packing.
60. Piston Rod.
61. Piston Head.
62. Piston Packing Rings.
63. Truck Center Casting.
64. Front Cylinder-Head.
65. Cylinder Head Casing.
66. Cylinder Lagging.
67. Cylinder Casing.
68. Cylinder Cocks.
69. Cylinder Cocks Rigging.
70. Engine Truck.
71. Engine Truck Wheel.
72. Engine Truck Tire.
73. Engine Truck Axle.
74. Engine Truck Brass.
75. Engine Truck Box.
76. Engine Truck Pedestal.
77. Engine Truck Frame.
78. Engine Truck Pedestal Brace.
79. Engine Truck Frame Brace.
80. Engine Truck Equalizer.
81. Engine Truck Spring Hanger.
82. Engine Truck Spring.
83. Engine Truck Spring Band.
84. Front Signal Line Cock.
85. Safety Hanger.
86. Truck Brake.
87. Wheel Guard.
88. Air Signal Pipe.
89. Guides.
90. Guide Yoke.
91. Guide Block.
92. Main Rod.
93. Main Rod Front Strap.
94. Key.
95. Crosshead Pin.
96. Crosshead.
97. Front Frame.
98. Air Drum Bracket.
99. Air Drum.
100. Pump Connection.
101. Train Pipe Connection from Main Reservoir.
102. Valve Stem Rod.
103. Train Pipe.
104. Wash Out Plugs.
105. Link.
106. Suspension Stud.
107. Link Block Pin.
108. Link Block.
109. Eccentric Connection, Back Up.
110. Eccentric Connection, Go Ahead.
111. Link Hanger.
112. Tumbling Shaft Arm.
113. Tumbling Shaft.
114. Tumbling Shaft Lever.
115. Counter Balance Spring and Rig.
116. Rocker.
117. Rocker Box.
118. Reach Rod.
119. Branch Pipe.
120. Check Valve Case.
121. Check Valve.
122. Flues.
123. Oil Pipe.
124. Horizontal Boiler Seam.
125. Circumferential Seam.
126. Boiler Lagging.
127. Boiler Jacket.
128. Jacket Bands.
129. Hand Rail.
130. Hand Rail Brackets.
131. Bell Stand.
132. Bell.
133. Air Bell Ringer.
134. Sand Box.
135. Sand Box Lever.
136. Sand Pipe.
137. Driving Wheel Tire.
138. Driving Wheel Centers.
139. Ash Pan.
140. Driver Brakes.
141. Driver Springs.
142. Driver Spring Hangers.
143. Driver Spring Equalizers.
144. Driver Spring Hanger Brace.
145. Lower Rail of Frame.
146. Pedestal Brace.
147. Driving Box Shoe.
148. Driving Box Wedge.
149. Wedge Bolt.
150. Driving Box.
151. Driving Axle.
152. Side or Parallel Rod.
153. Rod Bush.
154. Main Rod Connection.
155. Main Frame.
156. Frame Brace.
157. Frame Splice.
158. Go Ahead Eccentric.
159. Back Up Eccentric.
160. Go Ahead Eccentric Rod.
161. Go Ahead Eccentric Strap.
162. Back Up Eccentric Rod.
163. Back Up Eccentric Strap.
164. Grate Shaking Rig.
165. Rocking Grates.
166. Expansion Pad.
167. Expansion Link.
168. Running Board.
169. Air Cylinder Brake Pump.
170. Steam Cylinder Brake Pump.
171. Air Strainer.
172. Delivery to Drum.
173. Drip Cock.
174. Pump Piston Packing.
175 Pump Exhaust Connection.
176. Pump Steam Connection.
177. Governor.
178. Pump Valve Case.
179. Injector.
180. Injector Overflow.
181. Water Pipe.
182. Steam Pipe.
183. Steam Valve.
184. Primer.
185. Water Valve.
186. Fire Box.
187. Tube Sheet.
188. Radial Stay Bolts.
189. Sling Stay.
190. Stay Bolts.
191. Dry Pipe.
192. Stand Pipe.
193. Dry Pipe Hangers.
194. Throttle Pipe.
195. Throttle Valve.
196. Throttle Bell Crank.
197. Throttle Stem.
198. Dome.
199. Dome Cap.
200. Dome Casing.
201. Safety Valves.
202. Chime Whistles.
203. Whistle Rig.
204. Ventilator.
205. Cab.
206. Air Pump Lubricator.
207. Air Gauge.
208. Steam Gauge.
209. Steam Turret.
210. Injector Throttle.
211. Blower Cock.
212. Gauge Lamp.
213. Signal Whistle.
214. Air Pump Throttle.
215. Throttle Lever.
216. Sand Lever.
217. Reverse Lever.
218. Engineer's Brake Valve.
219. Gauge Cocks.
220. Quadrant.
221. Cut Out Valve.
222. Fire Door.
223. Cylinder Cock Lever.
224. Sight-Feed Lubricator.
225. Oil Can Shelf.
226. Hand Hold.
227. Shake Lever Stub.
228. Ash Pan Damper Handle.
229. Whistle Signal Valve.
230. Brake Valve Reservoir.
231. Train Pipe.
232. Train Pipe Hose.
233. Signal Pipe.
234. Signal Pipe Hose.
235. Feed Pipe Hanger.
236. Feed Pipe.
237. Feed Pipe Hose.
238. Tail Piece of Frame.
239. Cab Bracket.
240. Counter Balance Weight.



SECTIONAL VIEW OF MODERN LOCOMOTIVE.

indicates no front wheels, 4 drivers and no trailing wheels, a plain 4 wheel switcher. Some leave out the hyphens between the numbers but it is sometimes likely to be confusing, as with the decapod which becomes 2100 without the hyphens or 2-10-0 with them. The following table makes it plain:

Whyte's Locomotive Classification Adopted by American Locomotive Company.



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Fred H. Colvin, M. E.,
Author, ‹American Compound Locomotives.›

Locomotive Engine, The. In the course of three quarters of a century, a vast wilderness on the American continent has been changed from gloomy untrodden forests, dismal swamps and pathless prairies into the abode of a high civilization. Prosperous states teeming with populous towns, fertile farms, blooming gardens and comfortable homes have arisen from regions where savage men and wild animals united to maintain sterile desolation. The most potent factor in this beneficent change has been the operation of railroads by the locomotive engine.

Importance of Easy Means of Intercommunication.— Easy means of intercommunication have been properly encouraged by all nations and races that ever have made material progress in the arts of civilization. Lord Bacon says: "There are three things that make a nation great and prosperous — a fertile soil, busy workshops and easy conveyance of men and animals from place to place." That opinion was founded upon an intimate knowledge of the world's history; knowledge of the forces, the institutions and the conveniences that contributed to make nations great.

When the idea of applying the potential power of heat through steam to lighten the drudgery of mankind was little more than a philosopher's dream, when a practical steam engine was only a hope, its most useful field was by most far-seeing men considered to be in carrying heavy burdens and in bringing distant places into closer communication. The need of improved methods of transportation, which so long oppressed the human race, did not, however, produce the steam engine. Grim necessity brought it forth when great properties were falling into ruin, because sufficient animal power could not be concentrated to perform stupendous efforts in limited space. The steam engine was invented when horses could not do the work of pumping water out of valuable mines 500 feet deep. It was a foregone conclusion that the steam engine would be applied to locomotive purposes as soon as increasing business rendered animals unequal to the task of supplying necessary motive power on roads and on water ways. See Railway Transportation.

Slow Evolution of the Steam Engine.—After a practical steam engine was put to work on the simple operation of driving a pump, it took half a century of invention to develop it into a motor suitable for driving manufacturing machinery; another half century passed before inventors seriously began the attempt of building a steam engine that could be used to propel a vehicle on land. Far-seeing, progressive men who kept themselves informed on leading inventive achievements were convinced long before steam was applied to land transportation that peripatetic steam engines would be forthcoming when sufficiently urgent necessity would arrive.

When the 19th century opened, Great Britain, more than any other country, needed the use of the steam engine for help in land transportation. Tedious delay occurred before the mill driving engine was applied to vehicles, the principal obstacle being the weight of the ponderous slow moving condensing steam engine which James Watt (q.v.) developed and made popular. A new type was required which in due time was invented by Oliver Evans (q.v.), an American, and utilized by various British engineers. Evans had struggled to interest his own countrymen in his high pressure steam engine but they failed to recognize its merit and refused to aid the inventor. He sent drawings to Europe, hoping that he would be more fortunate with European capitalists. His designs fell into hands that returned no recompense or acknowledgment, but they were used to guide others in building engines that were used for land propulsion.

First Attempts to Produce a Steam Locomotive.— Early in the eighteenth century a variety of attempts were made in England to produce a steam locomotive. Richard Trevithick (q.v.), a Cornish mining engineer, built several steam carriages for common roads and one engine to run on rails, but they were all failures although they possessed the elements that would have produced a successful locomotive in the hands of a persistent inventor. The first man to build a locomotive to run on rails and haul cars regularly was William Hedley, chief engineer of Wylam colliery on the River Tyne, near Newcastle, England. His first engine was not a success but his experience with its shortcomings enabled Hedley to build a second locomotive which worked fairly well, and is now to be seen in the South Kensington Museum, London, bearing the name of "Puffing Billy."

This engine (figure 1), which was built in 1813, had a return flue boiler, had upright cylinders and was a sort of grasshopper tyoe of locomotive, which under a variety of modifications became the fashion and held the field up to 1829, when the directors of the Liverpool and Manchester Railway offered a prize for a locomotive that would fulfill certain practical requirements. A variety of locomotives were entered for competition and the prize was awarded to the "Rocket," made by George Stephenson & Son. This engine gave a new type of locomotive to the world which by mere increase of size is the locomotive of the 20th century.

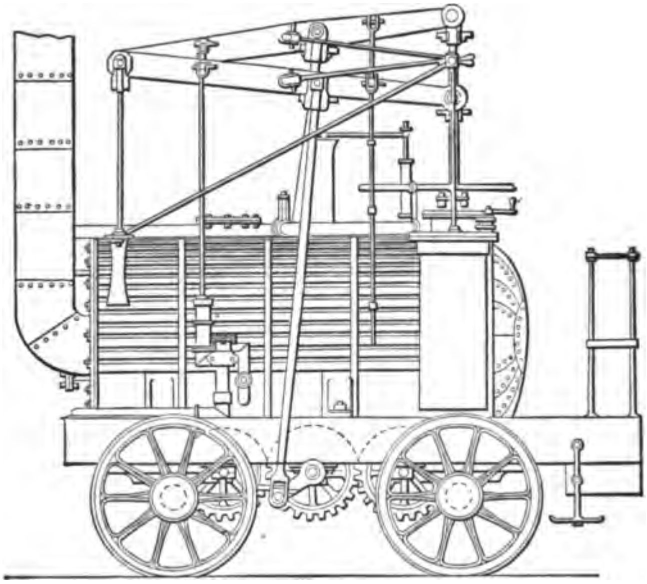


FIG. 1.

Essential Elements of a Locomotive.—The elements combined to make a locomotive engine successful are a boiler that will generate steam rapidly and simple mechanism that will transmit the power directly to the driving wheels. The Rocket had a multitubular boiler, combustion being stimulated by exhaust steam passing through the smoke stack; and the cylinders transmitted the power to the driving wheels without the intervention of any useless beams or rods and the mechanism could be easily handled by one man.

The Rocket (figure 2) was a four wheel engine, the front pair being the drivers, to which power was transmitted from two outside cylinders placed diagonally across the boiler pointing backwards. The first improvement made was to drop the cylinders to nearly a horizontal position which was followed by the cylinders being placed in the smoke box transmitting the power through a cranked driving axle. Most of the locomotive builders in Great Britain readily recognized the merits of the simple form of engine introduced by the Stephensons and they proceeded to develop the motor on similar lines.

Stephenson's Rocket.—There was no original feature about the Rocket, all the elements having been previously employed by other engineers, but the combination was the work of a master mind and gave to George Stephenson, (q.v) the reputation of being the inventor of the locomotive which is more than his due. When the locomotive is closely analyzed, we find that no proof exists of George Stephenson having invented anything which became a permanent attachment. The tubular boiler had been applied to a boiler by Marc Seguin, a French railway master mechanic, several years before the Rocket was built, they were used in the United States in marine boilers before Stephenson's time, and the steam jet in the chimney had been used by Trevithick, Hedley, and others. But if Stephenson was deficient in inventive attributes he had the faculty of knowing a good thing when he saw it. He was one of the first men in Great Britain to realize that there was a great future for the steam engine as motive power for land transportation and he persisted in promoting the interests of the locomotive when it had few influential friends. Stephenson was a good representative of the best type of Englishmen. Opinionated and ever pushing his opinions with bull dog tenacity, he made weaker minds yield before his views on railways and locomotives. This was his hobby and he rode it so furiously that the British world was drawn along often against its will. By his dominant will, persistent determination and forcible arguments, he prevailed on British capitalists to construct an expensive railway for general transportation and induced them to try locomotives when all the scientific world insisted that locomotives were impracticable. He gave his country the glory of originating steam operated railways at the moment when America was almost ready to grasp the prize of honor.

Within a year after the Liverpool and Manchester Railway was opened, a host of other railway enterprises were in progress. The first locomotive almost universally used at that time was carried on four wheels, one pair of small carrying wheels close to the smoke box and one pair of driving wheels in front of the fire box. The boiler was about nine feet long and included an internal fire box about three feet long. The furnace in the Hedley and other early locomotives was located in the internal flue, which in some cases provided the whole of the heating surface; in other cases an addition of a return flue was made. When the Rocket was designed it was determined to employ small tubes to convey the heat of combustion to the water in the boiler, a change which involved the use of a fire box as a furnace. That was made of rectangular section with flat walls which had to be strongly stayed to the outside shell, a water space being provided between the two surfaces. A smoke box with length about one quarter the diameter of the boiler was provided for the passage of the fire gases on their passage to the chimney. In the smoke box was located the opening of the steam exhaust pipe pointing straight through the center of the chimney and acting as a draft inducer. This combination of a multitubular boiler, a fire box surrounded by water and an exhaust steam jet located in the smoke box form the combined elements which make a high speed locomotive a possibility. They were first used together in the Rocket.

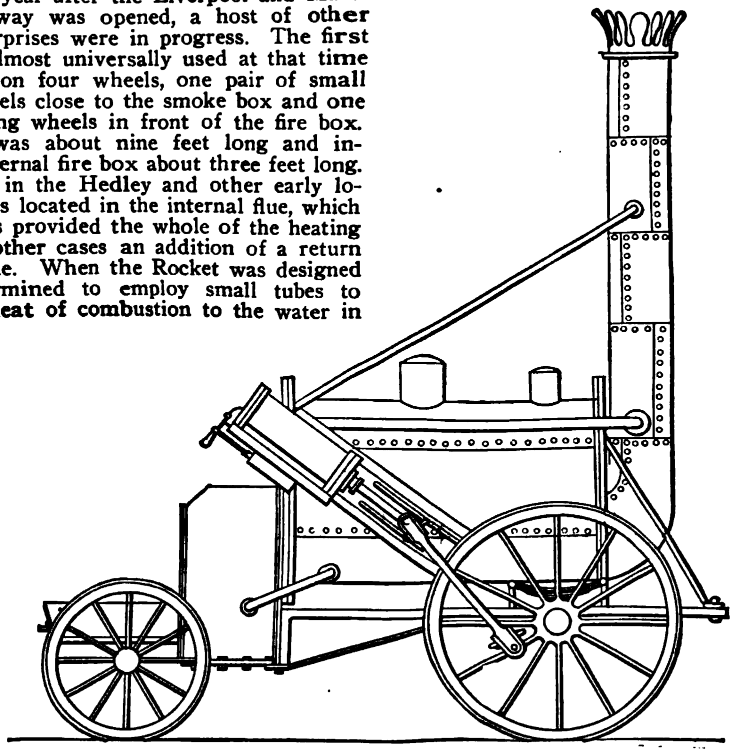


FIG. 2.

Development of the Locomotive in Europe. — The line of development exerted upon the locomotive was increasing the number of wheels and the proportions of boiler cylinders and running gear. In Europe the engine was at an early day provided with a pair of carrying wheels under the foot plate. The wheel arrangement then was one pair of small carrying wheels in front, a pair of large driving wheels in the middle and a pair of carrying wheels behind. It made a conveniently simply arrangement for light trains. When the single pair of driving wheels were found insufficient to provide the necessary adhesion, coupled driving wheels were introduced. For freight service European locomotive designers at an early day introduced the use of three pairs of wheels coupled without any carrying wheels. That remained almost the universal practice until about 1900 when four pairs of driving wheels coupled began to find favor. On railways on the continent of Europe, British practice was closely imitated for years but in some cases very heavy multi-coupled wheel locomotives were used for freight service. In the British Isles inside cylinders were preferred with a plain slide valve operated bv a link motion; on the Continent outside cylinders found most favor and articulated valve motion is more in favor than the link motion.

Genesis of Railroads in America.—The movement in favor of building railroads began in the United States about the same time as it began to influence public opinion in Great Britain. The 19th century had not advanced many years when people in the United States commenced to realize the urgent necessity for good arteries of intercommunication as a means of developing the extensive unsettled territory of the country. Statesmen were aware that the immense regions comprising the Roman Empire had been tied to the central government by a system of magnificent roads. There are numerous long reaching navigable rivers and there are a great many inland lakes on the American continent, but geographically they are far apart and there is no means of reaching vast regions except by land transportation. A series of Appian Ways was the solution of land travel advocated by political leaders. To the ordinary thinker a system of macadam roads would have solved the difficulty; but such roads were not made to any great extent, for the cost of making them was beyond the means of a thinly populated country where material for road making was frequently very scarce. An agitation in favor of providing a system of canal for inland transportation led to the construction of a great many artificial water ways (see CANALS), but they proved to be a great disappointment. The world of the infant republic could not hold its pace to the speed of the slow moving canal boat, which was prostrated by frost a large part of the time. Some better means must be found to move the increasing volume of merchandise and grain and coal and ore to the centers of consumption. The pinch of necessity wonderfully quickens the inventive faculties. Long before a mile of railroad was built in the United States, the seers, the men of penetrating vision, were discussing the possibilities of the steam engine as a means of accelerating land travel. The high pressure steam engine had been invented by Oliver Evans (q.v.), a native of Delaware, as an improvement of the Newcomen engine. Associated with the Evans engine were ideas of portability that were suppressed in the presence of Watts' ponderous slow-moving engines.

Colonel John Stevens (q.v.), a very influential American citizen, as early as 1812 advocated the use of railroads and in that year published a pamphlet on the superior advantage of Railways and Steam-carriage and Canal Navigation in which he outlined schemes of construction which were not greatly deviated from when actual railroad building commenced. The views of Colonel Stevens began gradually to have supporters and the sentiment in favor of railroad building spread slowly.

Baltimore and Ohio Railroad.— The first practical move of any importance was the building of the Baltimore and Ohio Railroad which was chartered in 1827 and partly opened in 1830. Other railroads were under construction at the same time and 1830 may be noted as the natal year of the American locomotive. Little was known anywhere about locomotives when railroad construction was inaugurated in the United States. Crude forms of locomotives had been used in the north of England for about fifteen years but even the scientific world of Great Britain knew almost nothing about them. It is not then surprising that Americans as a rule knew very little about what foreigners had done when they began building railways and their first locomotives were purely of original design. Very little accurate information had reached America concerning what had been done abroad before our people proceeded earnestly with the building of railroads. Before the railroad era there was scarcely any means of circulating scientific information, and few Americans had any idea of how railroads and the motive power for operating the same ought to be built, but that was considered no obstacle; they proceeded vigorously to construct railroads, learning the business over many expensive mistakes. The nation has always been noted for self-reliance, and the pioneer railroad builders pushed along without hesitation, crossing the bridges of difficulty when they were reached. When a portion of the Baltimore and Ohio Railroad was ready for business in 1830, few people believed that locomotives could be built that could operate the road which was remarkably crooked. Popular belief was that hauling railroad cars would be a new line of enterprise for the mule that had supplied motive power to the canals. But Peter Cooper (q.v.), a merchant of Baltimore, considered that the use of steam was essential to make railroad operating a success and he had a small locomotive built to prove the faith that was in him. His engine, the "Tom Thumb," was little more than a model but it developed one and a half horse power and proved that a steam locomotive could be used in operating around very short curves.

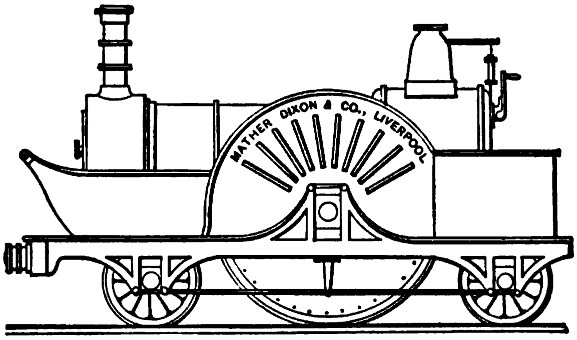
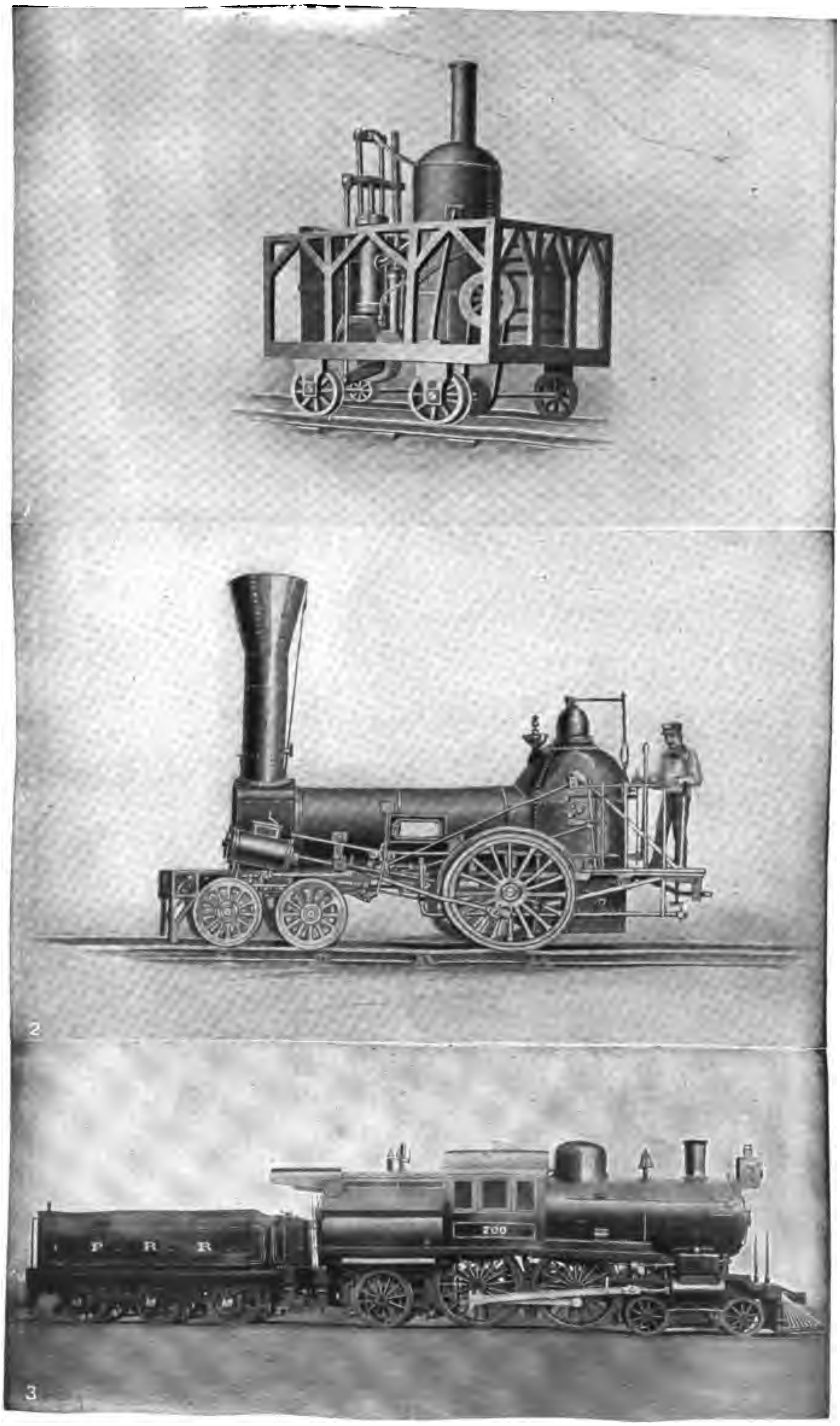


FIG. 3.

Cooper's «Tom Thumb.»—The Tom Thumb has an upright multitubular boiler but no claim for originality was advanced for it, as Nathan Read, of Warren, Mass., had patented such a boiler in 1791. The single cylinder was upright and transmitted power to the driving axle through a gear wheel. The engine performed the work for which it was built and for a time its form exercised considerable influence on the designing of American locomotives. Shortly after the experiments were made with Peter Cooper's model, the Baltimore and Ohio Railroad Company advertised, offering a premium of $500 for a locomotive built in the United



1. American Locomotive of 1830.
2. American Locomotive of 1840.
3. American Locomotive of 1900.

States which would meet certain specified conditions. The offer brought to the company five locomotives all built at different places, all of original design and all of them practical engines. That which was selected was built by Phineas Davis, of York, Pa. It had upright boiler and cylinders, after Cooper's idea, and was the first in America of a class of engines called «grasshoppers» that were a familiar feature on the Baltimore and Ohio Railroad for many years. The upright boiler and cylinders did not appeal to the mechanical men of other railroads. Most of them had engines built with a horizontal boiler resting on an oblong frame which carried the cylinders and secured the running gear. Even the small engines resting on four wheels were found to act injuriously upon the slender track of the pioneer railroads and the first important improvement effected by American engineers was putting the weight upon three pairs of wheels, two pairs forming the leading truck. This was done in 1832 by John B. Jervis (q.v.), chief engineer of the Mohawk & Hudson Railroad. That leading truck soon came to be a regular feature of American locomotives.

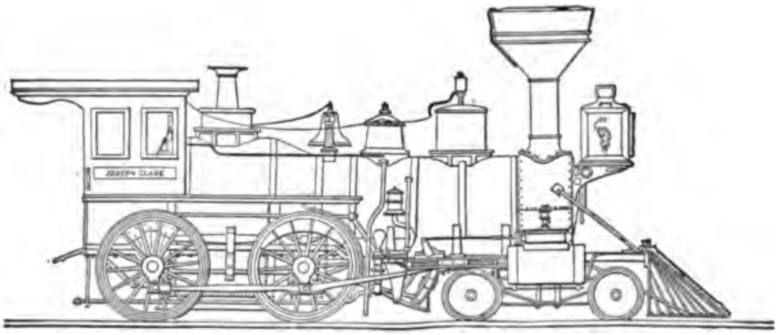


Fig. 4.

Jervis Invents the Four Wheel Truck.— The course of evolution of the American locomotive turned upon methods of making the engines more powerful with due regard for the weakness of the rails the trains had to run upon. For about 20 years after the first locomotive was put to work in the United States, the design worked out by Jervis of a single pair of driving wheels and a four-wheel truck was the prevailing type. Then another pair of driving wheels was added, these being coupled to the main driving wheels, making what was long known as the American locomotive (figure 4). An important improvement effected upon this engine was placing equalizing beams between the driving wheels, which modified the shocks given by imperfect track.

The railroad companies having the haulage of coal, metals and other heavy freight began about 1850 to introduce locomotives of much greater power than the eight-wheel engine and those with six coupled wheels worked gradually into favor. Some companies used six-wheel connected engines without any carrying wheels; but the favorite heavy engine for many years was known as a ten wheeler, its arrangement being a four wheel truck and three pairs of driving wheels coupled. Then came the mogul engine, which had a pony truck in front consisting of a single pair of wheels and three pairs of driving wheels connected. This gave the means of using a greater proportion of the weight for adhesion than was practicable with a ten wheel engine of the same weight.

Working Out Details.— For many years American railway master mechanics worked on making a locomotive as simple as possible, and the working parts were so proportioned and arranged that the repair expenses would be as low as possible. Various forms of running gear and foundation supports were tried; wooden frames, combined wood and iron frames, outside and inside frames made of iron plate or of iron bars. The fittest to survive were inside iron bar frames which for one decade before the 20th century began were gradually giving way to cast steel. The boiler material for many years was iron with, in some instances, copper fire boxes and brass tubes. The fuel used for the first 40 years of the railroad era was almost exclusively wood, but that became so dear in some quarters that the burning of coal had to be introduced. When that was successfully accomplished it was found that copper fire boxes and brass tubes wore rapidly from the attrition of the hard particles of the coal. This led to the universal introduction of iron for fire boxes and tubes. The heat generated in a coal burning fire box is so intense that it was found to create blisters and flaws in the imperfectly welded iron. After much careful manipulation a mild form of steel was produced that proved a safe, strong and durable material for fire boxes. When this fact was satisfactorily demonstrated steel took the place of iron and it is still the only material used for locomotive fire boxes on the American continent. The successful use of steel fire boxes led to the same material being used for boiler shells. There again it proved itself superior to iron and all locomotive boilers are now made of mild steel.

The lines of progress then pursued by American railway mechanical engineers were: maintaining simplicity of parts while increasing the proportions for the purpose of making the locomotive sufficiently powerful to meet the requirements of fast and heavy trains. The fragile track over which the early lomotives were operated called for extraordinary care in reducing as far as possible the shocks resulting from the moving of the power-producing machinery, and of the running gear. Counterbalancing the driving wheels and reciprocating parts of the engine received the greatest possible attention, and equalizing beams were introduced at an early day to distribute evenly among the wheels and springs the concussions caused by low joints and other defects of the track. Steel wheel tires that are almost immune from breakage gradually took the place of cast iron and wrought iron, which were originally employed exclusively for tire-making. Experience and theory both having demonstrated that high boiler pressure was necessary to produce economical use of fuel, a high quality of steel was produced for the construction of boilers and furnaces, with the most gratifying results. Steel boiler tubes have taken the place of copper, brass, or iron, and failures from this troublesome part of a locomotive boiler have been reduced to the lowest limits. Not a small part of the increased efficiency of boilers is due to highly perfected appliances provided for feeding the water. Injectors that can be regulated to supply exactly the volume of feed water required have pushed out of service the erratic and unreliable force pump, a change which protracts the life of the boiler by obviating extremes of temperature.

Although it was of the utmost importance for the safety of the public, and of every one connected with the operating of the locomotive, that the boiler pressure should be maintained below a certain tension, serious defects were long common in the construction of safety valves, with the result that boiler explosions were painfully common. In fact, one of the pioneer railway companies advertised that it kept a car loaded with cotton bales next to the engine to prevent passengers from being injured when the boiler exploded. That source of danger has gradually been eliminated, and modern safety valves may be depended upon to prevent the steam pressure rising more than two or three pounds per square inch above the blowing-off point.

The efficiency of the engine has been decidedly improved by setting the cylinders horizontally, thereby providing for direct transmission of power in line with the axles.

In the pioneer days of locomotive building, very little attention was bestowed upon the lubrication of valves and cylinders, an intermittent charge of tallow being considered sufficient, a practice which led to serious loss of power through excessive friction. The attention of inventors was directed to this defect of the locomotive, and a long line of patented lubricators were produced. The latest appliances for lubricating valves and pistons are now so efficient that a constant supply of lubricant is assured.

For many years after locomotives came into use great efforts were made and much expense incurred in giving the engines an ornate appearance. That fashion was gradually abandoned, and severe simplicity of form and modest coloring is more consonant with the character of the modern locomotive.

Sixty-Miles-an-Hour Engines.— When the locomotive had been in use in this country about 20 years, there arose an agitation for engines that would maintain a speed of about 60 miles an hour. Under this demand a number of locomotives were built with a single pair of driving wheels, but the movement toward high speed was short lived. Most of these high speed engines resembled the English engine, figure 3. The designers of such engines appeared to think that the size of cylinders and driving wheels formed the measure of the speed capacity of a locomotive, but dearly bought experience taught them that the real controlling element is the size of boiler, which, in the engines referred to, was very small. For many years the growth of the locomotive was restricted by the comparatively fragile iron rail. The iron rail wore so rapidly and laminated so badly under heavy or sharp wheel impact, that prudent railroad managers generally restrained other officials in their zeal to increase the hauling power, and therefore the weight, of their locomotives. Until steel rails were introduced the subject of wear of rails was one of extraordinary solicitude to railroad managers.

Steel Rails.— In 1870 steel rails were beginning to be appreciated for their extraordinary wearing qualities. That time may be regarded as the beginning of the movement toward making the locomotive as powerful as it is possible to make a motor which has to run on a rail gauge of 56½ inches and pass under bridges and tunnels about 15 feet high. In 1870 the vast majority of locomotives in the United States were of the eight-wheel or American type, with cylinders 16 x 24 inches, driving wheels 60 inches in diameter, heating surface 900 square feet, grate area 12 square feet, total weight 50,000 pounds. Such an engine was used for all species of service, and was justly considered the best all-round locomotive that had even been employed. The wear-resisting steel rail has permitted locomotive builders to develop the eight-wheel engine until it has become common to carry 20,000 pounds on each driving-wheel, and as much as 25,000 pounds per wheel has been tried. That was beyond the limit of cool journal impact and led to the introduction of more driving-wheels, or a pair of carrying wheels under the foot plate in the highly popular locomotive known as the «Atlantic» or 4-4-2 type.

Increasing the Boiler Capacity.— The development of the boiler to supply steam to cylinders as large as 23 x 32 inches was the result of very skillful and ingenious labor performed by the most accomplished locomotive designers in the country. To produce a boiler of liberal steam-generating capacity it was necessary to increase the grate area. With the eight-wheel engine, which became the object of development, the fire-box was between the frames and the forward and back driving axles. Under these conditions the width could not be more than 34½ inches and the length 72 inches, so that little more than 17 square feet of grate area could be secured. When attempts were made to force these small fire-boxes to their utmost, it became a common practice to urge the fire with such intensity that from 100 to 200 pounds of coal per square foot of grate area would frequently be burned per hour. This was done with great waste of fuel and with destructive effects upon the fire-box. The necessity for an abnormally large grate to burn anthracite coal induced James Millholland, superintendent of motive power of the Philadelphia & Reading Railroad, in 1857, to place the grate above the frames, which gave a material increase of grate surface. Zerah Colburn, in 1854, designed some engines for a road which is now the Delaware, Lackawanna & Western Railroad, with fire-box 7

cent, presumably at a profit. The steady decrease in freight rates will be understood by an examination of the annexed table. The distance from Chicago to New York is about 1,000 miles. The figures in the table apply to any territory for the whole or a part of the distance hauled.

RATES IN CENTS PER BUSHEL OF WHEAT AND CORN FROM CHICAGO TO NEW YORK.

Year	Wheat		Corn	
	By rail Cents	By rail and water Cents	By rail Cents	By water Cents
1870	26.11	19.58	24.37	19.32
1880	19.8	15.8	17.48	14.43
1890	14.3	8.52	11.36	7.32
1900	10.8	....	10.1	....
1904	11.4	....	10.6	....

Influence of Steel Rails and Huge Locomotives.— The use of steel rails and huge locomotives has exerted tremendously far-reaching effects and has created social revolutions in certain parts of the world. They brought the cereals of regions west of the Missouri River and of the remote Northwest into competition with the grain-raising districts of the Eastern States and with those of Europe, Africa, and Asia. It threw many farms in New England and along the Atlantic seaboard out of cultivation, and it caused a semi-revolution in farming business in the British Isles, strongly affecting the condition and fortunes of millions of people. Irish peasants used to go in thousands to England and Scotland to work on the harvesting of the grain crops, thereby earning enough money to pay the rent of their small holdings. Steel rails and consolidation locomotives stopped the cultivation of so many grain fields in the British Isles that the help of the Irish worker was no longer needed. The suffering and discontent arising from the changed conditions led to the vigorous agitation for home rule in Ireland; and in the year 1904 an agitation exists for a duty on grain entering Great Britain, for the protection of British farmers.

While inflicting injury and suffering upon the few, progress as represented by Bessemer's great invention and by the enterprise of American railway master mechanics has exercised a beneficent influence upon the many, and the world at large has been a great gainer from the skill and the enterprise of the inventor of a marvelous system of steel-making, of the American mechanic, of the engineer, of the railroad constructor, and of the railroad manager. They have together built a monument to progress which will always be regarded by a grateful people as one of the highest achievements the world has ever witnessed. ANGUS SINCLAIR,
Editor 'Railway and Locomotive Engineering.'

Locomotive and Engine Industry. It is not difficult to trace the inception and progress of locomotive engineering in the United States. Although other lines of rails had previously been laid for special purposes, the Baltimore and Ohio and the South Carolina railroads — both begun in 1828 — were the first American railways constructed to carry passengers and freight. Upon the former was run the first American-built locomotive, that of Peter Cooper, constructed in 1829, a mere working model, not intended for permanent service, but to demonstrate the practicability of operating the line by locomotive power. It did this successfully, and led to the completion of the road, which otherwise might have been abandoned. This little machine, with a single cylinder three and a half inches in diameter, a boiler no larger than that of an ordinary kitchen-range, and tubes improvised from gun barrels, on its trial run attained a speed of 18 miles an hour, and hauled 40 passengers besides the driver, who was Peter Cooper himself. The first locomotive for real service used in the United States was the Stourbridge Lion, built at Stourbridge, England, and imported by Horatio Allen, in 1829, for the Delaware & Hudson Canal Company. In 1830, the first locomotive constructed in the United States for actual work, the Best Friend, was built by the West Point Foundry, for the South Carolina Railroad. In 1831 Matthias W. Baldwin, a manufacturer of bookbinders' tools, of Philadelphia, was engaged by the proprietors of Peale's Museum, of Philadelphia, to construct a model locomotive to operate on a circular track, to satisfy the public curiosity growing out of the Rainhill contest, in England, which had resulted in a victory for Robert Stephenson's Rocket, and which was then attracting widespread attention. In September 1832, there were built at York, Pa., by Davis & Gartner, three locomotives of the "grasshopper" pattern, for the Baltimore and Ohio Railroad, from designs of Phineas Davis and Ross Winans. Some of these locomotives continued in service about 60 years, and were in use at Mount Clare, in Baltimore. The success of the Peale Museum model was such that Mr. Baldwin was employed by the Philadelphia, Germantown and Norristown Railroad Company, in 1831, to construct a locomotive for their line. This locomotive, Old Ironsides, was completed in November 1832. It was a four-wheel engine, similar to the English design of the day, and weighed in running order over five tons. The rear, or driving wheels, were 54 inches in diameter, placed on a crank axle. The cylinders were 9½ inches in diameter, by 18 inches stroke, and were attached horizontally to the smoke-box; the frame was of wood; the wheels had heavy cast-iron hubs, wooden spokes and rims, and wrought-iron tires; there was no cab; and the tender was four-wheeled, with wooden sides and back for holding the wood used for fuel, and an iron box for water-tank. This locomotive attained a speed of 30 miles an hour, with its train attached, and upon a special occasion it is said to have attained a speed of 60 miles per hour. Locomotive engine building may be said to have become fairly established by 1834; but in those early days, when there was no practice to guide, skilled workmen were few, and few shop facilities existed, the difficulties surrounding the locomotive builder were extraordinary, and only the most indomitable perseverance attained success. The American pioneers of railway mechanics were Cooper, Allen, Baldwin, Rogers, Norris, Winans, Campbell, and their co-workers, and later William Mason, Cooke, McQueen, Millholland, and Hudson.

The early American locomotives were similar in all essential features to the English engines of the day, being constructed from published descriptions or from actual observation of them. The importation of English locomotives did not long continue, for the early American builders soon made radical departures from

Manufacturing Company, who subsequently gained fame and wealth in railway operations in Russia. In the West were the Cuyahoga Works of Cleveland, those of Scovill at Chicago, Booth & Company at San Francisco, and others at Detroit and Milwaukee. Later the Rome Locomotive Works, at Rome, N. Y., entered the field, but had only a few years of disastrous existence, which ended in 1891. The list might perhaps be extended further, but it is a more agreeable task to record the works which were in business in 1901 to 1903.

The Baldwin Locomotive Works of Philadelphia were established in 1831 by Matthias W. Baldwin, as has before been mentioned. The annual capacity is more than 1,200 locomotives. The works occupy 16 acres in the centre of the city. A number of the buildings of later construction are from four to six stories high and of the most substantial character. Employment is given to upward of 10,000 men. The total production of these works from their establishment to 1901 was nearly 20,000 locomotives.

The Rogers Locomotive Works, of Paterson, N. J., were founded in 1836 by the firm of Rogers, Ketchum & Grosvenor. The mechanical head and dominating spirit was Thomas Rogers. Upon his death in 1856 the business was incorporated under the title of The Rogers Locomotive and Machine Works, of which Jacob S. Rogers was president. Owing to J. S. Rogers' increasing age, the company was reorganized in 1892 under its present title of The Rogers Locomotive Company. These works give employment to about 1,400 men, and have an annual capacity of 250 locomotives.

The period of business prosperity which followed the war with Spain in 1898 was marked by the consolidation of the competing members of many industries into large corporations or so-called «trusts.» This movement extended to the locomotive industry and the eight works next mentioned were in July 1901 purchased and united into one organization known as The American Locomotive Company. Its officers are S. R. Callaway, president; Albert J. Pitkin, first vice-president; R. J. Gross, second vice-president; Leigh Best, secretary, and James E. Sague, mechanical engineer. This company has a capital of $50,000,000, half of which is common stock and half is cumulative, 7 per cent preferred stock. The works acquired by the company, with the approximate capacity of each, are as follows:

	Locomotives per annum
Schenectady Works, Schenectady, N. Y.	450
Brooks Works, Dunkirk, N. Y.	450
Pittsburg Works, Pittsburg, Pa.	200
Rhode Island Works, Providence, R. I.	150
Richmond Works, Richmond, Va.	150
Cooke Works, Paterson, N. J.	125
Manchester Works, Manchester, N. H.	100
Dickson Works, Scranton, Pa.	85
Approximate total capacity	1,710

Following is a brief sketch of the history of each of these works: The Schenectady Locomotive Works established by Norris Brothers in 1848, passed into the sole control of John Ellis in 1863, who was succeeded by his sons, John C. Ellis, Charles G. Ellis, Edward Ellis, and William D. Ellis, in succession.

The Cooke Locomotive and Machine Company of Paterson, N. J., began the manufacture of locomotives in 1852. The works were established about 1800, and for 50 years were engaged in the manufacture of cotton and other machinery. The original shops in Paterson have recently been abandoned to other uses, and new and completely modern shops have been built.

The Pittsburg Locomotive Works, organized in August 1865, were completed so far as to construct their first locomotive in the latter part of 1866. The works were originally designed for a capacity of 30 locomotives a year, but by the construction of new fire-proof buildings, and the addition of new and improved machinery, the capacity has been gradually increased. The works occupy nearly 12 acres of ground, and their equipment includes the most improved hydraulic, pneumatic, and electric appliances for fashioning the work and handling materials. There is also a completely appointed laboratory for chemical and physical tests of materials.

The Rhode Island Locomotive Works of Providence were likewise established in 1865. These works have occupied an important position in the field of locomotive manufacture.

The Brooks Locomotive Works of Dunkirk, N. Y., were originally constructed as the locomotive building and repair shops of the Erie Railway. In 1869, Jay Gould, then president of the Erie Railway, having completed extensive shops at a more central location on the line of that road, ordered the Dunkirk shops to be permanently closed, and the machinery removed to other locations. Horatio G. Brooks, at that time superintendent of motive power and machinery of the Erie Railway, whose home was at Dunkirk, and whose interests were identified with the welfare of that place, made a proposition to Mr. Gould for a lease of the shops and machinery for the purpose of establishing the business of locomotive-building. The lease was consummated in November 1869, and before the close of the year the first two locomotives of the new Brooks Locomotive Works were turned out. In 1883 the property, comprising 20 acres of land, the permanent plant, additions and machinery, was purchased from the New York, Lake Erie and Western Railroad Company by the Brooks Locomotive Works.

The Richmond Locomotive and Machine Company of Richmond, Va., is the only locomotive-manufacturing plant in the South. The works were established in 1865 for the manufacture of plantation and saw-mill machinery, and were gradually adapted for the construction of tram and street-car motors. In 1880, the shop having been destroyed by fire, it was removed beyond the city limits and reconstructed upon an enlarged scale. In 1889 it secured the contract from the United States government for building the machinery of the armored battleship Texas, which gave it wide prominence.

The Lima Locomotive and Machine Company of Lima, Ohio, is not only one of the old concerns, but its position in the trade has always been an important one.

The Dickson Manufacturing Company of Scranton, Pa., are important manufacturers of locomotives and of mining machinery, for which their location in the anthracite coal regions of Pennsylvania is most suitable. These works were established in 1862.

The Manchester Locomotive Works, of Manchester, N. H., were established in the early similarly attacked. The demand for American locomotives is constantly growing and further increase of the export business may be expected.

The market price of a locomotive in 1832 appears to have been $4,000, this sum having been agreed upon between Matthias W. Baldwin and the Philadelphia, Germantown and Norristown Railroad for the locomotive Old Ironsides. The highest prices known in locomotive-building, as in other industries, were those obtained during the Civil War, when heavy freight or passenger locomotives commanded from $30,000 to $35,000. Prices declined after the close of the War to about $7,000 for a 35-ton passenger locomotive in 1878–9. During the so-called boom of 1880–1, prices again rose to about $15,000 each for similar passenger locomotives; but since that time there has been a constant reduction in the price per pound, the weights of locomotives gradually increasing with the demands of increasing traffic, while prices remained nearly stationary until 1896 at about $8,000 to $9,000 each for average passenger locomotives, and from $9,000 to $10,000 each for average freight locomotives.

In 1897, with the introduction of the 50-ton steel car, a further considerable advance began in the weight and power of locomotives. The ordinary weight of Consolidation freight locomotives, which had been from 60 to 70 tons, was increased to 80 to 100 tons, and a number were constructed as heavy as 115 tons (of 2,000 pounds) exclusive of tender. The extraordinary business activity which began in 1898 increased the earnings of railroads and therefore their purchasing power. On this account and on account of the heavier classes of locomotives introduced and on account of higher costs of materials and labor, the average price of freight locomotives advanced to about $15,000 or $16,000, and the average price of passenger locomotives to almost the same figures. The demand for power sufficient to handle heavy trains at sustained high speeds, capable of accelerating speed rapidly after starting caused the introduction of heavier types of passenger locomotives. The eight-wheel or American type became inadequate to these increased demands, and the ten-wheel engine, except for heavy grades, involved the disadvantages of comparatively small driving wheels, an unsatisfactory form of firebox, an adhesion altogether in excess of actual requirements under ordinary conditions, and excessive resistance within the machine itself. To meet these objections the Atlantic type was brought out by the Baldwin Locomotive Works. It is substantially a ten-wheel locomotive with very large driving-wheels, and the rear pair of driving-wheels replaced by a pair of trailing wheels. The lower side of the trailing wheels permits of a deep firebox of large grate and large cubic area for thorough combustion. An enormous boiler capacity is available in proportion to the adhesion. The driving-wheels are closely coupled and the total wheel-base is long enough to give great smoothness of motion at high speed, and is sufficiently flexible.

The importance of fuel economy was appreciated in Europe earlier than in the United States. Progress had been made in the development of the compound locomotive by Lindner, Von Borries, La Page, Worsdell, Webb, and others. W. S. Hudson, superintendent of the Rogers Locomotive Works, designed a two-cylinder, or cross-compound, locomotive, as early as 1873, but it was never built. In 1882 Henry D. Dunbar designed and patented a four-cylinder tandem compound locomotive, which was tested on the Boston and Albany Railroad. In 1889 the Pennsylvania Railroad imported from England a compound locomotive of Webb's pattern for experimental service. The same year Samuel M. Vauclain, superintendent of the Baldwin Locomotive Works, designed a four-cylinder compound locomotive, in which a high-pressure and a low-pressure cylinder are placed one above the other on each side of the locomotive, both formed within a single casting, together with the steam-chest, and occupying the same place as the ordinary single-expansion cylinders. The two piston-rods connect to a common cross-head, but back of the cross-head pin there is no essential difference from the ordinary engine. About the same time A. J. Pitkin, superintendent of the Schenectady Locomotive Works, brought out a two-cylinder, or cross-compound, locomotive, having a form of intercepting-valve differing from those previously used abroad. The general interest in compound locomotives, together with the powerful influence of two of the most prominent works in the country, led to the rapid introduction of compound locomotives, and caused other locomotive-builders to bring out similar designs. There have since been built in the United States about 3,500 compound locomotives, of which more than 3,000 are of the Vauclain pattern, some are of the four-cylinder "tandem" type, and most of the remainder are of the two-cylinder or cross-compound type. The compound locomotive is unquestionably a step in advance, realizing an economy of 15 to 40 per cent, according to the service in which it is employed.

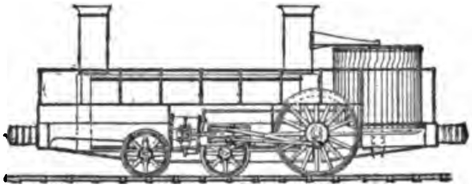
The most conspicuous improvement in transportation, which resulted from the introduction of steam-power, was the great increase in the capacity for high speed. Peter Cooper's first locomotive is said to have attained a speed of 18 miles per hour. Baldwin's Old Ironsides is recorded as having attained a speed of 60 miles per hour for a short distance. Speeds of 60 miles per hour have therefore been known from the early days of American railways. The real progress of locomotive development has not been so marked in increasing the capacity for speed as in increasing the weight of trains which can be hauled with certainty at rates of speed which have previously been regarded as phenomenal. Up to 1889, when the compound system was introducel, there did not exist a demand for sustained speeds exceeding 50 miles an hour. In November 1892, one of Vauclain's compounds, No. 385, running on the Philadelphia and Reading and the Jersey Central railroads, between Philadelphia and Jersey City, with a train of four heavy cars, attained a speed of 97 miles per hour by covering one mile in 37 seconds. On 10 May 1893, locomotive No. 999, of the New York Central Railroad, covered a mile in 32 seconds, equivalent to 112½ miles an hour, hauling the Empire State express, consisting of four heavy cars. On 19 July 1893 engine No. 682, a Vauclain compound, of the Philadelphia and Reading Railroad, hauled a train of nine loaded passenger cars from Winslow Junction to Pleasantville, 26 miles, in 22 minutes, or at the rate of 70.9 miles per hour, and on 27 August, thousand wants of daily life, such as the furnishing of the water-supply of great cities, the driving of industrial machinery, the lighting of streets and houses, the running of elevators in high modern buildings, the extinguishing of fires, and the operating of the electric tram-car. For many years the development of the stationary engine and the marine engine were identical. The first experimental steam-engine built in the United States is said to have been constructed in 1773 by Christopher Colles, a lecturer before the American Philosophical Society at Philadelphia. In 1787 John Fitch launched on the Delaware River at Philadelphia a steamboat propelled by paddles, which attained a speed of 13 miles per hour, and in 1796 he experimented in New York with one operated by a screw. His efforts were closely followed by those of Robert Livingston. About the same time other mechanics were devoting attention to the problem of steam navigation, among them Samuel Morey, Nathan Read, Nicholas Roosevelt, Oliver Evans, Robert Fulton, John Stevens, and others. Transatlantic steam navigation began in the year 1819, when the American steamer Savannah made the trip from Savannah to St. Petersburg. The development of the marine engine through its various forms of single expansion, compound, and triple expansion cylinders has resulted in the powerful mechanisms which drive the St. Louis, the St. Paul, the Oceanic, the Deutschland, and the Kronprinz Wilhelm at the rate of 500 to 600 miles per day. This development has resulted from the labors of many, among whom may be mentioned John and Robert Stevens, Robert Thurston, James P. Allair, the Copelands, and John Ericsson. Since 1850 the improvements have been rather in details of construction than in any marked change in type. The engineer has striven and is still striving for the highest efficiency with the greatest degree of economy. The introduction of what is known as the Corliss valve gear marks probably one of the greatest eras in engine building. This is a device by which the steam is admitted into the cylinder for any desired portion of the stroke, and the point of cut-off automatically maintained by the governor without affecting in the least the free opening of the exhaust. Many devices had been introduced before this time for the purpose of using the steam expansively, among which may be mentioned that of Frederick E. Sickles, in 1841, whose drop cut-off with detachable valve gear was used in this country until 1849, when George H. Corliss brought out the improved expansion gear which bears his name, and which is used to-day by builders all over the country. The adoption of the surface condenser may also be noted as an improvement of great practical utility in the economy of that class of engines to which it is adapted.

As the country developed, there was an ever-increasing call for smaller engines with higher speed and higher steam pressure. Excessively high pressures had already been experimented with as early as 1823 by Jacob Perkins, who in 1827 constructed a single-acting engine in which steam of 800 pounds pressure was used, and in the same year he made a compound on the Wolfe plan, in which he adopted a pressure of 1,400 pounds, expanded eight times. He even went so far as to propose to adopt a pressure of 2,000 pounds, using engines with small cylinder dimension and cutting off the admission at one sixteenth of the stroke. For obvious reasons these excessive pressures were not adopted in general practice, but the experiments had the effect in later years of calling the attention of builders to the greater economy of high pressure steam, and engines and boilers were adapted to its use in a moderate degree. This caused inventors to consider different plans by which high pressures could be utilized and high speed engines constructed. A number of designs were executed, among which may be noted the Westinghouse, which is a double-cylinder, single-acting engine. The low cost and simplicity, combined with a high degree of efficiency, have brought this engine into extensive use.

The steam turbine has recently attracted much attention on account of its remarkable steam economy and wide range of load. The force of the steam is converted into work through the impact and reaction due to its velocity, which is increased by liberation and expansion. The advantages obtained over the ordinary steam engine are the continuous rotative action, and the absence of dead centres and consequent mechanical complications, and the absence of the strains suddenly applied and reversed which are unavoidable in a reciprocating engine. Two systems are, at present, in use, the De Laval and the Parsons. The former is on the principle of the axial jet turbine water wheel, the jet of steam being brought in contact with the blades of the turbine wheel, at the proper angle, and passing through to the discharge. In order to obtain the greatest effect, it is necessary that the turbine attain a high velocity, sometimes 30,000 revolutions a minute. This excessive speed is reduced to the normal by a specially designed system of gearing. The Parsons steam turbine is manufactured by the Westinghouse Machine Company, and it differs from the De Laval system in that the main armature or drum can be run at a lower rate of speed with economical results. The cylindrical steam chamber is of varying internal diameter and provided with numerous rows of curved guide plates or vanes. Central drums of correspondingly varying diameter, on which are secured similar rows of blades spaced to fit between the stationary rows, form the rotating portion, and its shaft may be coupled direct to the armature of a dynamo or receive a pulley for belt drive. The stationary rows of blades serve to guide the steam in the proper direction for doing its work upon the movable ones. The steam is introduced at the small end of the chamber and acts first upon the smaller set of blades; from this it is expanded into the larger portion of the chamber and acts upon the next larger set of blades and so on throughout the series. By this arrangement which increases the diameter of the rotating parts, the speed of the shaft is reduced and the necessity of back gearing is avoided.

Much attention is likewise being directed to the economies available by the gas-engine. Such engines are now working in units of upward of 700 horse-power and, using gas prepared in special generators, give favorable indications of effecting further important economies in the conversion of heat into power.

The competition among engine builders has caused marked changes to be made in simplifying and reducing the cost of manufacture. Probably no change which has been made equals that scribes an engine in which «*one* eccentric, *one* valve, *one* crosshead, *one* connecting rod and *one* steam box serve both cylinders.» He evidently abandoned this, as in the engine shown he used two crossheads and two connecting rods, although he used but one valve. He also used a fan condenser as will be seen, and claimed a vacuum of 24 inches. The cylinders of this engine were 6 and 14 inches respectively, or a ratio of 1 to 5.4. Another plan of his was also shown, but there is no record of its having been built. He used 115 pounds of steam, but predicted the use of 200 pounds in the nearer future than it was realized. His patent was dated 3 Dec. 1846. Other early inventors were: John Nicholson, James Samuels and Frazer Selby, all English.



Compound Locomotive of Thomas Craddock. 1848.

The first American compound locomotive was built at the Shepard Iron Works, in Buffalo, from the designs of Perry & Lay in 1867. A switching engine of the Erie Railroad had their tandem cylinders placed on it. This engine worked nicely and ran for several years, but coal economy was still a question of the future, and as it was ahead of its time, the idea was abandoned. The next compound was of the two-cylinder type and was built in 1870 by the Remington Arms Company, at Ilion, N. Y., from the design of William Baxter. This was used on a suburban road, the Worcester and Shrewsbury, and gave good service. It has an intercepting valve under control of the engineer, and could be run as a simple engine any length of time. On 11 March 1873, a patent was granted William S. Hudson, of the Rogers Locomotive Works, Paterson, N. J., for a superheater in smoke-box, so arranged as to reheat the steam passing from high pressure to low pressure cylinders of a two-cylinder compound. This is sometimes cited as the first two-cylinder compound, but in reality none were built, and it was preceded by others as we have seen. About this time the compound began to excite more interest both in England and on the Continent. Prominent among them were Anatole M. Mallet, Francis William Webb, August Von Borries and Robert Lindmer.

This brings us to the later American designs, with which we are most interested. On 25 June 1889 a patent was granted to Samuel M. Vauclain, of Philadelphia, for a four-cylinder type of engine. Cylinders were parallel and connected to one crosshead. One patent shows two piston valves, another shows but one, which is the style now used and known as either the «Vauclain» or «Baldwin» type. It is rather a curious matter of patent history that on 18 June 1889, one week earlier, Joseph Lewis, of South Evanston, Ill., obtained a patent for a similar engine, except that the one piston valve was rotated by gearing instead of being a reciprocating valve. This engine has never been in service, however.

On 10 Dec. 1889 Albert J. Pitkin obtained his patent on what is now known as the Schenectady compound. As first built it went into compound automatically and could not be run as a simple engine except at the start, but this has been modified so as to make it optional with the engineer. On 27 May 1890 Henry F. Colvin, of Philadelphia, obtained a patent on the application of an automatic reducing valve to admit live steam to low pressure cylinder just in proportion to ratio of cylinders, so as to keep the total power on each side equal. This engine was built by the Pittsburg Locomotive Works. The Pittsburg compound has the intercepting valve on the high pressure side and it is not moved to compound automatically, but is moved independent of pressure in the receiver. It can be run simple any length of time (as is now common with them all), but this and the Rhode Island were the first to have this feature, except the Baxter before mentioned. In starting, the high pressure cylinder receives steam as usual, and the steam for the low goes through the reducing valve into the receiver, a separate passage being provided for the high pressure. Moving the valve into compound position shuts the live steam from the receiver and closes the independent exhaust of the high pressure cylinder and turns it into the receiver to the low.

The late C. H. Batchellor patented what is known as the Rhode Island compound on 22 Sept. 1891. This was similar to the Pittsburg engine in some ways, but had the intercepting valve on the low pressure side and goes into the compound automatically by an accumulation of reserve pressure. The Richmond compound (Mellin System) has the intercepting valve on the low pressure side, and is moved automatically by the receiver pressure.

The Richmond engine was the first to use an overpass valve. With an engine running without steam or «drifting» as railroad men call it, the cylinders become air-pumps. The air forced out drafts the fire at a time when it is not needed, and on mountainous roads cuts quite a figure in coal consumption. While this is present in any engine, it is aggravated in the large cylinder of a compound, and is usually met by the use of a vacuum valve at each end of the cylinder. These admit air and do not overcome the needless draft on fire. It is often charged that two-cylinder compounds «nose» around on account of developing more power on one side than the other, but this would seem to be largely imagination. A simple engine is always working one-sided in so far as one side is at maximum while the other is a minimum power, and it is nothing out of the usual to bring an engine in with one side uncoupled, the other doing all the work. The fallacy of one-sided working when running simple on account of large cylinders is shown by the action of reducing valve and the fact that careful tests show a variation of less than 2 per cent with careful designing. This is no more than is apt to be found on any engine after having its cylinders bored larger than the other — being simply trued up. The fact that a compound engine has more power when working simple than in compound is generally taken as showing that the reducing valve does not act quickly and the large cylinder gets more than its proportion of steam. That this is not the case we learn that the safety valve in the receiver passage — set to

well seasoned, but because of its unusual resonance, giving a ringing report when struck upon the pavement as a signal which can be obtained from no other wood. In various parts of Europe great attention has been paid to the propagation of this tree, for ornament as well as for its useful properties, and its cultivation is further encouraged by the absence of the destroying insect above mentioned. It forms a pleasing object along the borders of many of the railways on the Continent, its spines adding to its usefulness as a hedge. When in bloom, the large pendulous racemes of fragrant white flowers, contrasting with the light-green foliage, produce a fine effect, and give this tree a rank among the most ornamental. The leaves are pinnate, and the leaflets very thin and smooth. The flowers, resembling in form those of the pea, diffuse a delicious perfume, and are succeeded by a flat pod.

The chief objection to the tree is its liability to the attacks of insects, more than 40 species being known to feed upon its leaves and wood. The foliage destroyers, which include leaf-rollers, leaf-miners, and several species that feed in exposed positions, are sometimes seriously destructive, the larvæ of one species, a saw-fly (*Nematis similaris*), sometimes destroying all the green parts. But they are less destructive than the borers which tunnel through and weaken the wood. Sometimes they are so numerous that the trees become mere shells of bark with a honeycomb of wood. The more important of these are the locust borer (*Cyllene robiniæ*), a black and yellow striped, long horned beetle in the adult stage, which is common in the eastern United States; and the larvæ of a moth (*Sciapteron robiniæ*), troublesome in the Pacific Coast region. These and some others have discouraged the commercial planting of this valuable tree.

Another American «locust» tree is found in the two species of the genus *Gleditsia* of the senna family, which includes the Kentucky coffee tree. These are the water or swamp locust (*G. aquatica*) of Florida, which has enormous spines and reddish flat oval pods; and the well-known and widely planted honey locust or honey shucks (*G. triacanthos*). This large graceful but exceedingly thorny tree bears especially fragrant flowers, and its pods are gathered by country people in the South and eaten for the sake of the sweet pulp between the seeds. Its great pods measure 10 to 20 inches long; are curved, and «in drying twist and retwist while they open, and skilfully scatter seeds in diverse directions.»

Lod'don, Australia, one of the most important rivers of Victoria; rising on the northern slopes of the Dividing Range, in Talbot County, flowing northwest for 250 miles, and joining the Murray at Swan Hill. It drains a basin of 4,800 miles and is subject to floods. Good cod and bream abound in it.

Lode, a metalliferous deposit, usually having the character of an ore-producing vein — confined within walls and having something of regularity. The name is sometimes applied to any regular course or vein, metallic or otherwise.

Lodeman, lō'dē-man, **Ernest Gustavus,** American horticulturist: b. Neuchâtel, Switzerland, 1867; d. 1896. He was graduated from the Michigan Agricultural College in 1889, in 1890 was appointed assistant to Professor Liberty H. Bailey of Cornell, and somewhat later an instructor in the university. He was the originator of the «spray-calendar,» a tabulated form furnishing the dates for spraying the fungi and insect pests of given crops and receipts for the preparation of suitable compounds for such use. His only publication is ‹The Spraying of Plants› (1896), a valuable manual.

Lode'star, Loadstar, Polaris, or **Guiding Star,** various names given to the polar star which is the last star in the tail of the Little Bear. It is a star of the second magnitude, located 1° 20′ from the North Pole.

Lodge, George Cabot, American poet: b. Boston 10 Oct. 1873. He is a son of H. C. Lodge (q.v.) and was graduated from Harvard in 1895. During the Spanish-American War he served in the American navy as ensign. He has published ‹Song of the Wave› (1898); ‹Poems› (1902).

Lodge, Gonzales, American classical scholar: b. Fort Littleton, Pa., 19 Dec. 1863. He was graduated from Johns Hopkins University in 1883, was professor of Greek in Davidson College, N. C., 1886–8, and at Bryn Mawr College, 1889–1900. Since 1900 he has been professor of Greek and Latin at the Teachers' College of Columbia. He has published ‹Lexicon Plautinum› (1901), and with Gildersleeve, ‹Gildersleeve-Lodge Latin Grammar and Latin Composition.› He has edited ‹The Gorgias of Plato› (1890), and the ‹Gildersleeve-Lodge Latin Series.›

Lodge, Henry Cabot, American politician and author: b. Boston 12 May 1850. He was graduated from Harvard in 1871 and from the law school in 1875, being admitted to the bar in 1876. In 1873–6 he was editor of the ‹North American Review›; was then lecturer on history at Harvard till 1879, when he became editor of the ‹International Review› till 1881. Becoming active in political life he served two terms in the Massachusetts legislature; was elected to Congress in 1886, and served till 1893, when he was elected to the Senate; and was re-elected in 1899. He was also delegate-at-large to the Republican National Conventions in 1884 and 1896, and permanent chairman of the 1900 convention. He has strongly advocated protection, and the restriction of immigration and the protection of the franchise by educational qualifications; he was a strong supporter of the policy of the administration during the Spanish War, and in regard to the Philippines, and was made chairman of the Senate committee on the Philippines, and a member of the committee on foreign relations. He has published ‹Life and Letters of George Cabot› (1877); ‹Short History of the English Colonies in America› (1881); ‹Alexander Hamilton› (1882); ‹Daniel Webster› (1883), and ‹George Washington› (1889), in the ‹American Statesmen› series; ‹Studies in History› (1884); ‹Boston› (1891, in the ‹Historic Towns› series); ‹Hero Tales from American History› (with Theodore Roosevelt, 1895); ‹Certain Accepted Heroes› (1897); ‹Story of the American Revolution› (1898); ‹The War with Spain› (1899); and a volume of ‹Speeches›; he has also edited the works of Alexander Hamilton (1885).

Lodge, Sir Oliver Joseph, English physicist: b. near Stoke-upon Trent, Staffordshire, 12 June 1851. He was educated at University College, London, and was demonstrator of physics there in 1875, and in 1877 professor. He was professor of physics in University College, Liverpool, 1881–1900, and since the date last named has been principal of the University of Birmingham. He has published ‹Elementary Mechanics› (1877); ‹Modern Views of Electricity› (1889); ‹Pioneers of Science›; ‹Signalling Without Wires›; ‹Lightning Conductors and Lightning Guards.›

Lodge, Thomas, English dramatist and poet: b. West Ham, near London, England, about 1556; d. London September 1625. He entered at Lincoln's Inn, but seems to have led a wild and rollicking life, and in 1589–91 varied his life by taking part in two sea expeditions against the Spaniards, in the neighborhood of the Azores and Canary Islands. On the earlier of these he wrote the famous pastoral ‹Rosalynde: Euphyes's Golden Legacie› (1590), which supplied Shakespeare with the basis of ‹As You Like It.› Lodge himself wrote two dramas, ‹The Wounds of Civil War› (1594; reprinted in Hazlitt's Dodsley's ‹Select Collection of Old Plays,› Vol. VII.), and ‹A Looking-glass for London and England› (1594), in collaboration with Robert Greene. Consult Jusserand, ‹The English Novel in the Time of Shakespeare› (1890).

Lodi, lō'dē, Italy, a town in the province of Milan, Lombardy, on the Adda, 18 miles southeast of Milan. The principal buildings are the duomo or cathedral, a Gothic structure of the 12th century; the octagonal church of the Incoronata; the town-house; the episcopal palace; the Barni and Merlini palaces. Majolica and delftware, refined wax, saltpeter, and chemical products are manufactured. Stracchino and Parmesan cheese, which, though it takes its name from Parma, from which it was first exported, is almost wholly made in the district around Lodi, utilizing the milk of several thousand cows. The chief incident in Lodi's history is the entry by Napoleon after the famous passage of the Bridge of Lodi effected against the Austrians in 1796. Pop. (1901) 27,811.

Lodomeria, lō-dō-mē'rĭ-ạ, Austria-Hungary, a former independent principality in Volhynia, since the division of Poland in 1772 constituting an integral part of Galicia (q.v.).

Lodz, lōdz, Russian Poland, the capital of a district in the government of Piotrkow, 76 miles southwest of Warsaw, and an important manufacturing centre, the terminus of a branch line from the Warsaw & Vienna Railway. It has made considerable modern progress owing to the flourishing condition of its cotton, woolen, and other manufactures. Silk goods are also manufactured, and there are dyeworks, breweries, machine-works, etc. The Roman Catholic Poles number about 40 per cent, German Protestants 33 per cent, and Jews 27 per cent of the population, which from 50,000 in 1872 had increased in 1897 to 315,209.

Loeb, lėb, **Jacques,** German-American physiological chemist and biologist: b. Germany 7 April 1859. He studied at Berlin, Munich, and Strasburg, was assistant at both Würzburg (1886–8) and Strasburg (1888–90), studied at the Naples zoological station, and in 1891–2 was associate professor of biology at Bryn Mawr College. In 1892 he became assistant professor of physiology and experimental biology at the University of Chicago, and in 1895 associate professor. He was also professor of physiology at the Rush Medical College of Chicago from 1900. In 1902 he was appointed professor of physiology in the University of California. His chief work has been in physiological chemistry. He is the first to make researches in regard to tropic and chemical reactions in animal life. His experiments have shown that many activities of the animal world previously ascribed to ganglia and brain-centres are really due to such reactions. Thus he found that a certain chemical solution effects the contraction of muscular tissue known as «heart-beats,» as tested on detached heart-tissue and hearts of certain animals and by introduction of the solution into human blood-vessels. He also made experiments in artificial partheno-genesis. He has published numerous essays, largely in the ‹American Journal of Physiology,› and a volume ‹Comparative Physiology of the Brain and Comparative Psychology› (1900).

Loeb, Louis, American artist: b. Cleveland, Ohio, 1860. He completed his studies in art under Gérôme in Paris, winning honorable mention at the Salon in 1895, and a 3d medal in 1897. As artist, illustrator, and teacher he has secured a notable place. His studio is in New York. As an illustrator of books and magazines he has shown both strength and inventive ability. In 1903 his exhibition of oils at the new rooms of the Co-operative Society in New York aroused interest in his later work, which shows a steady progress in his artistic achievements.

Loess, lės or lō'es, a loamy deposit of Pleistocene age, abundantly developed in the valleys of the Rhine, the Danube, the Rhone, and many of their tributaries. It is a pulverulent yellowish-gray or brownish loam, homogeneous and non-plastic, and consists principally of clay with small angular grains of quartz, and extremely minute scales of mica, together with a larger or smaller admixture of carbonate of lime and some iron oxide. It has a tendency to cleave in vertical planes, and thus forms cliffs where streams intersect it. The organic remains of the loess consist principally of land-shells of existing species, but now and again fresh-water shells are met with. Occasionally, also, the remains of man and the Pleistocene mammals are encountered. The deposit varies from a small thickness up to nearly 300 feet, and occurs at greatly differing levels, so that more than one agency would seem to have been active in its formation. Escaping flood-waters from glaciers are believed to have made much of the deposit; some of it may have been the result of weathering and rain-washings. The European loess is undoubtedly associated with the glacial deposits of the Continent, and in North America, where it is strongly developed, being very thick, as it is in parts of China (q.v.), the same relationship obtains. The geologists of the United States Geologolical Survey maintain that the accumulations which cover enormous areas in the great basin traversed by the Mississippi and its affluents are essentially fluviatile. Richthofen believes the Chinese accumulation to have been of æolian origin, and this theory of wind-blown material has also been advanced with respect to deposits in the United States; but the general opinion of geologists favors the theory of aqueous origin for the whole formation. Consult: Sixth Annual Report of the United States Geological Survey (1888); Chamberlin and Salisbury, ‹The Driftless Area of the Upper Mississippi Valley›; McGee, ‹The Pleistocene History of Northeastern Iowa,› in the United States Geological Survey, Eleventh Annual Report (1891); Geikie, ‹Prehistoric Europe› (1881).

Loewe, Wilhelm (also called Loewe-Kalbe), German politician: b. Olvenstedt, near Magdeburg 1814; d. 1886. He was educated at Halle, and adopted the medical profession. Elected in 1848 to the Frankfort Parliament, he acted with the extreme party of democracy; became first vice-president of the Parliament; and later, at Stuttgart, was its president. Charged with sedition in this, which was considered a revolutionary procedure, and once acquitted, he was nevertheless sentenced to life imprisonment for contumacy. After some years in Switzerland, France, and England, he came to this country, and for eight years practised medicine in New York. Availing himself of the amnesty in 1861, he returned to Germany, and in 1863 was elected to the Prussian House of Deputies. Four years later he was a Progressist member of the North German Reichstag. Disagreeing with his party in 1874, on the military law, he attempted to form a new Liberal party. In the elections of 1881 he lost his seat.

Loewenthal, lė'vĕn-täl, **Henry**, American journalist: b. New York 15 May 1853. Trained in the public schools and the College of New York, he studied law at the Columbia College Law School, taking his degree in 1875. He began newspaper work on the New York *Tribune* as reporter in 1872. In 1875 he was appointed law reporter on the New York *Times* and acting city editor in 1878. In 1879 to 1893 he was city editor, and from 1873 to 1896 had charge of real estate matters. In August 1896 he became managing editor, a position he now (1903) holds.

Loewy, lė-vē', **Maurice**, French astronomer: b. Vienna 1833. He studied astronomy and was given a position in the observatory at Paris by Leverrier, and after the latter's death assisted Mouchez in the observatory of Montsouris. He is noted for his invention of the *Equatorial-coude*, or Elbow-equatorial, in which the observer remains seated at the upper end of the polar axis of the telescope, as if working with a microscope on a table, with the means of directing his view to any part of the heavens under his control. He also devised improved methods of determining the constants of astronomical refraction and aberration.

Lofoten, lō-fō'ten, or **Lofodden**, Norway, a group of islands off the northwest coast, stretching southwest to northeast about 175 miles. The largest are Andoen, Langoen, Hindoen, East and West Vaagen, and Flagstadöe. They have bold, precipitous, rugged, and deeply indented coasts. and an elevated, sterile interior, several containing mountains which, though not lofty, are covered with perpetual snow. Immense shoals of cod and herring frequent their shores, and extensive and valuable fisheries are carried on. The principal cod-fishery beginning January-February, ends in April, but the herring-fishery continues, and furnishes an important branch of national revenue. In ordinary years about 4,000 boats, each manned by five hands, are employed. The celebrated whirlpool, the Maelstrom, is situated at the southern extremity of these islands. Permanent population of group, about 20,000.

Lof'tie, William John, Irish Anglican clergyman, writer on antiquities: b. Tandragee, County Armagh, 25 July 1839. He was educated at Trinity College, Dublin, and after holding temporary Church appointments, became assistant minister of the Chapel Royal, Savoy, in 1871. He joined the staff of the ‹Saturday Review,› and in 1894 that of the ‹National Observer.› As a writer on antiquarian subjects he successfully combines learning and picturesque statement. He has published, ‹Round About London› (1877; 4th ed. 1880); ‹Plea for Art in the House› (1877); ‹Memorials of the Savoy› (1879); ‹A Ride in Egypt› (1879); ‹A History of London› (1883); ‹Authorized Guide to the Tower of London› (1886); ‹London› (1887); ‹Windsor› (1887); ‹Westminster Abbey› (1890); ‹The Cathedral Churches of England› (1892); ‹Inigo Jones and Wren› (1893); ‹Inns of Court and Chancery› (1894); ‹London Afternoons› (1901); etc.

Lof'tus, Augustus William Frederick Spencer, English diplomatist: b. 4 Oct. 1817; d. 9 March 1904. He entered the diplomatic service in 1837 as attaché at Berlin and was likewise attaché at Stuttgart in 1844. He was secretary to Stratford Canning in 1848, and after serving as secretary of legation at Stuttgart (1852), and Berlin (1853), was envoy at Vienna (1858), Berlin (1860) and Munich (1862); became ambassador at Berlin 1865, to the North German Confederation 1868–71, and to Saint Petersburg 1871–9. He was governor of New South Wales 1879–85. He published ‹The Diplomatic Reminiscences of Lord Augustus Loftus› (1892–4).

Log, an apparatus used to measure the rate of a ship's velocity through the water. For this purpose there are several inventions, but the one most generally used is the following, called the common log. It is a piece of thin board, forming the quadrant of a circle of about 6 inches radius, and balanced by a small plate of lead, nailed on the circular part, so as to swim perpendicularly in the water, with the greater part immersed. The log-line is fastened to the log by means of two legs, one of which is knotted, through a hole at one corner, while the other is attached to a pin fixed in a hole at the other corner, so as to draw out when sufficient force is exerted on it. The log-line, being divided by means of knots of colored cloth into certain lengths, which are in proportion to an equal number of geographical miles, as a half or quarter minute is to an hour of time, is wound about a reel. The whole is employed to measure the ship's head-way in the following manner: — The reel being held by one man, and the half-minute glass by another, the mate of the watch fixes the pin and throws the log over the stern, which, swimming perpendicularly, feels an immediate resistance, and is considered as fixed, the line being slackened over the stern to prevent the pin coming out. The knots are measured from a mark on the line at the distance of 12 or 15 fathoms from the log. The part of the line between the log and this mark is called the stray-line. The glass is turned at the instant that the mark passes over the stern, and as soon as the sand in the glass is run out the line is stopped. The water then pressing on the log dislodges the pin, so that the board, now presenting only its edge to the water, is easily drawn aboard. The number of knots and fathoms which had run off at the expiration of the glass determines the ship's velocity.

Log-book, a book in which are officially recorded the proceedings on board a ship. In it the contents of the log-board are daily transscribed at noon, together with every circumstance deserving notice that may happen to the ship or within her cognizance, either at sea or in a harbor, etc. In addition to the weather, speed, astronomical observations, etc., the entries required to be made include convictions, offenses, punishments, conduct of crew, illnesses and injuries, deaths, births, and marriages, quitting the ship, wages of men entering the navy, wages of deceased seamen, sale of deceased seamen's effects, collisions — in short, every condition, occurrence, and transaction which comes under official notice. The log-book must be signed by master and mate, and certain other persons in particular cases.

Log Cabin and Hard Cider, a term used in American politics in the campaign of 1840. The Whig candidate for President, William Henry Harrison, was a military man of plain manners. One of the Democratic papers, scoffing at the Whigs for taking a candidate not of the first caliber, advised that Harrison be given a log cabin and a barrel of hard cider, and he would stay contentedly in Ohio. This was taken up by the Whigs, and really helped to make their candidate popular with the masses. Log cabins were erected in great numbers in the cities, and were carried in processions, accompanied with barrels of cider.

Log-rolling, in American politics, a term used for maneuvers of politicians. by which they seek to secure co-operation in carrying favorite measures through legislatures and other bodies. Generally log-rolling is employed by individuals who approach others in support of personal schemes and interests. The word was formerly very popular in the United States, but has become almost obsolete, being supplanted by the term «button-holing.»

Logaœdic (lŏg-ạ-ē'dĭk) **Verse,** in Greek and Latin poetry, a rhythm in ⅜ time; now obsolete and are rarely found except in imitations of classic lyric measures. See Metre; Rhyme.

Logan, lō'gạn, English name of the American Indian chief Tah-gah-jute: b. about 1725; d. 1780. He was the son of Shikellamy, a celebrated chief of the Cayugas, who lived at Shamokin on the Susquehanna, and was called Logan from James Logan, the secretary of Pennsylvania and a firm friend of the Indians. In his early manhood he was known throughout the frontier of Virginia and Pennsylvania for his fine personal appearance, engaging qualities, and his friendship for the whites. About 1770 he removed with his family to the banks of the Ohio, where he gave way in a measure to intemperance. In the spring of 1774 his family were massacred, it was alleged, by a party of whites led by Captain Cresap, under the pretext of retaliation for Indian murders; but it is exceedingly doubtful whether Cresap had any connection with the transaction. Logan at once instigated a war against the scattered settlers of the far West, and for several months fearful barbarities were perpetrated upon men, women, and children. He disdained to appear among the chiefs who subsequently sued for peace, but sent by an interpreter to Lord Dunmore, the governor of Virginia, the noted speech explaining his conduct, which was first published in Jefferson's ‘Notes on Virginia.’ Its authenticity is open to much doubt, however. While intoxicated he attacked a party of friendly Indians and was killed by his relative Tod-hah-dohs in self-defense.

Logan, Benjamin, American pioneer: b. Augusta County, Va., about 1752; d. Shelby County, Ky., 11 Dec. 1802. He early crossed the Alleghanies and became a settler in Kentucky. He was an associate of Simon Kenton and Daniel Boone in the Indian fighting then constantly in progress on the frontier. During the Revolutionary War he was also active in the contests between the colonial frontiersmen and the British and their Indian allies. In 1776 he built one mile east of Stanford, Ky., on the site now called St. Asaph's Spring, the stockade known as «Logan's fort.» When this fort had for weeks in 1777 been besieged by Indians, Logan made his way through the enemy's lines and traveled 150 miles to Holston where he obtained supplies and reinforcements. He participated as second in command in Colonel John Bowman's expedition against the Shawnees at Chillicothe, and led the force sent against the Indians under Simon Girty. His advance guard, through over-haste, was defeated at Blue Licks, and Logan himself did not reach the scene of battle until the succeeding day. In 1788 he commanded a force of 600 against the northwestern Indians. He was for many years a member of the Kentucky legislature; and sat also in the State constitutional conventions of 1792 and 1799. His prowess was celebrated on the frontier.

Logan, Celia. See Connelly, Celia Logan.

Logan, Cornelius Ambrosius, American dramatist: b. Baltimore, Md., 1806; d. near Wheeling, W. Va., 1853. After a varied career as actor and manager he became a theatrical manager in Cincinnati in 1840. He made a vigorous reply to Lyman Beecher's attack upon the stage from the pulpit; and wrote several successful plays, such as: ‘Yankee Land’ (1834); ‘The Way of Maine’; ‘A Hundred Years Hence’; a burlesque; ‘The Wood Dealer.’ He also wrote tales and poems.

Logan, George, American statesman and philanthropist; grandson of James Logan (q.v.), b. Stenton, near Philadelphia, 9 Sept. 1753; d. there, 9 April 1821. He was educated in England, subsequently studied medicine in Edinburgh, where he took the degree of M.D., and afterward returned in 1779 to America. For many years he devoted himself to agricultural pursuits, which he was one of the first in America to prosecute successfully in a scientific manner. He also served several terms in the Pennsylvania legislature. At the outbreak of the French Revolution he embraced with enthusiasm its democratic doctrines, and joined Jefferson and the republican party in opposition to the federalists. In 1798, the United States being then on the brink of a rupture with the French republic, he departed for France, under the idea that he might contribute to the preservation of peace. He was well received by Talleyrand and Merlin, then chief of the Directory, and returned to America with the assurance of the desire of the French government to renew amicable relations with the United States. But as he had taken with him letters of introduction from Jefferson instead of passports from the state department, he was denounced by the Federalists on his return as the treasonable envoy of a faction who had undertaken to institute a correspondence with a foreign and hostile power. He was coldly received by Washington and President Adams, and in the latter part of 1798 an act, known as the «Logan act,» was passed by congress, making it a high misdemeanor for a private citizen to interfere in a controversy between the United States and a foreign country as he had done. He was subsequently elected to the United States senate, of which body he remained a member 1801–7; and in 1810, urged by the same philanthropic motives which had induced him to visit France 12 years before, he went to England in the hope of preserving peace. In 1797 he published ‘Experiments on Gypsum’ and ‘Rotation of Crops.’

Logan, James, American colonial statesman and author: b. Lurgan, Ireland, 20 Oct. 1674; d. Stenton, near Philadelphia, Pa., 31 Oct. 1751. By his own efforts he acquired a knowledge of the chief ancient and modern languages, and in 1699, being then established in trade in Bristol, England, accepted an invitation from William Penn to accompany him to America in the capacity of secretary. In 1701, upon the return of Penn to England, he was appointed provincial secretary, and subsequently filled the offices of commissioner of property, chief justice, and president of the council, discharging in the last capacity the duties of governor of the province for two years after the demise of Governor Gordon in 1736. The latter years of his life were passed at his country-seat called Stenton, in the pursuit of literature and science. His chief work, ‘Experimenta et Meletemata de Plantarum Generatione’ (Leyden, 1739; London, translated from the Latin by Fothergill, 1747), an expansion of a paper on the growth of maize published in the ‘Philosophical Transactions’ for 1735, was considered an important contribution to the science of botany. He was the author of two other Latin treatises of a scientific character published in Holland, of an English translation of Cicero's ‘De Senectute,’ published in 1744 by Benjamin Franklin, and of Cato's ‘Distichs,’ the latter in verse; and he left a variety of papers on ethics and philology. The translation of Cicero was the first original one of a classical author printed in America. His library, numbering about 2,000 volumes, was, in conformity with his desire, presented to the city of Philadelphia, and is deposited in a separate department of the Philadelphia library under the name of the Loganian library. He was a member of the Society of Friends.

Logan, John, Scottish poet and Presbyterian clergyman: b. Soutra, Midlothian, Scotland, 1748; d. London, 28 Dec. 1788. In 1773 he was licensed as a preacher, and from his eloquence and fervor in the pulpit soon became popular. In 1786, however, owing to intemperate habits and kindred reasons, he was constrained to leave the ministry and going to London there engaged in literary work. His name is now best known in connection with that of Michael Bruce and the controverted authorship of the ‘Ode to the Cuckoo.’ That Logan is entitled to a place among the minor poets of Scotland is sufficiently attested by his exquisite lyric, ‘The Braes of Yarrow.’

Logan, John Alexander, American soldier and politician: b. Jackson County, Ill., 9 Feb. 1826; d. Washington, D. C., 26 Dec. 1886. He studied at Shiloh College, volunteered as a private in the Mexican War, became a lieutenant in the First Illinois infantry, after the war studied law, was graduated from Louisville University in 1851, was admitted to the bar, and was elected to the Illinois legislature in 1852 and 1856. In 1858 he was elected a representative in Congress as a Douglas Democrat, in 1860 was re-elected, but resigned his seat in 1861, and on 13 Sept. was appointed colonel of the 31st Illinois infantry. He led this regiment in the attacks on Fort Henry and Fort Donelson, and was wounded at the latter. On 5 March 1862, he was made a brigadier-general of volunteers, and after commanding the 3d division of McPherson's corps (the 17th) in the northern Mississippi campaign, became major-general on 26 Nov. 1862. He fought at Port Gibson, Raymond, Jackson, and Champion Hill, commanded the centre at Vicksburg, and was appointed military governor of the town upon its capture. In November 1863 he was made commander of the Fifteenth corps, which he led until the fall of Atlanta, save for a short period when in command of the army of the Tennessee. He then returned to take part in the Lincoln presidential campaign, but rejoined his corps, continued with it till Johnston's surrender, 26 April 1865, and afterward for a time commanded the Army of the Tennessee. In 1866–9 he sat in the 40th and 41st congresses as a Republican, and was also re-elected to the 42d, but before taking his seat was chosen by the Illinois legislature to the Senate, where he served from 1871 to 1877. He began legal practice in Chicago, but on 18 March 1879 again entered the Senate. While in Congress he distinguished himself by his eloquence. He was consistently opposed to the restoration of Fitz-John Porter to the army, and in June 1880 made a four-days' speech on the Porter bill. At the Republican national convention in Chicago in June 1884, he was a candidate for nomination to the Presidency, and after Blaine's nomination was nominated Vice-President by acclamation. Shortly after the defeat of this ticket, Logan was again chosen Republican senator from Illinois. Blaine said of him: «While there have been more illustrious military leaders in the United States and more illustrious leaders in legislative halls, there has, I think, been no man in this country who has combined the two careers in so eminent a degree as General Logan.» Consult the ‘Life’ by Dawson (1887).

Logan, Mary Simmerson Cunningham, American editor and journalist: b. Petersburg, Boone County, Mo., 15 Aug. 1838. She was married to John A. Logan (q.v.) in 1855 and since his death, in 1886, has edited 'The Home Magazine,' has contributed frequently to periodicals and has been editorially associated with the 'American Journal.'

Logan, Olive, American actress, lecturer and author: b. Elmira, N. Y., 16 April 1841. She began her career as an actress in Philadelphia in 1854; retired from the stage in 1868; since then has been a lecturer on social topics. She has published 'Chateau Frissac' (1865); 'Photographs of Paris Life' (1861); 'Women and Theatres'; and 'Before the Footlights and Behind the Scenes: a Book about the Show Business' (1870), besides several plays.

Logan, Stephen Trigg, American jurist: b. in Franklin County, Ky., in 1800; d. in 1880. After studying law and for a while practising in Kentucky he removed (1832) to Springfield, Ill., and there continued in the work of his profession. He became a circuit judge in 1835; was three times (1842, 1844, 1846) elected to the Illinois legislature; and was associated as law partner with Abraham Lincoln, from 1841 to 1844. He was one of those who in 1847 framed the new constitution of Illinois; was again elected to the legislature in 1854; joined the Republican party at its formation, and was a delegate to its national convention in Chicago in 1860.

Logan, Sir **William Edmond,** Canadian geologist: b. Montreal 20 April 1798; d. Castle Malgwin, Cardiganshire, Wales, 22 June 1875. He was educated chiefly in Edinburgh; was for a time a clerk in London, and afterward became manager of a copper-smelting works in Swansea. While there he devoted himself to the study of geology. In 1840 he went to Canada, and he was the chief of the Geological Survey of that country 1842–70. His writings appeared in the annual reports of the Canadian Survey; in the Proceedings of the British Association, the Geological Society, etc. He published 'Geology of Canada' (1863).

Logan, Ohio, village, county-seat of Hocking County; on the Hocking River, and on the Columbus, Hocking & Toledo railroad; about 45 miles southeast of Columbus. It is situated in the natural gas belt, and in the vicinity of some good farm lands. Nearby is found clay suitable for pottery and bricks. Its chief manufactures are flour, furniture, brick for paving and building, pottery, foundry products, and machinery. The village owns and operates the waterworks. The public library has nearly 3,000 volumes. Pop. (1900) 3,480.

Logan, Utah, city, county-seat of Cache County; on Logan River, and on the Oregon Short Line railroad; about 70 miles north of Salt Lake City. It was settled in 1859 and incorporated in 1866. It is located in an agricultural region with valuable mineral deposits in the vicinity. The chief industrial establishments are knitting-mills, lumber-mills, a brewery, a beet-sugar factory, and flour-mills. Some of the educational institutions are the Brigham Young College, opened in 1878 under the auspices of the Latter Day Saints, New Jersey Academy, under the auspices of Presbyterians, and the State Agriculture College. The waterworks are owned and operated by the city. The city government is according to the act of 1898, providing for the general government of the cities of the State. Pop. (1900) 5,451.

Logan, Mount, the second highest peak in North America, Mount McKinley (q.v.) being first, in the southwestern part of the district of Yukon in Canada. Its height is 19,500 feet.

Lo'gansport, Ind., city, county-seat of Cass County, locally known as the «City of Bridges,» 70 miles north by west of Indianapolis, where the Eel River flows into the Wabash. The city is an important railroad centre, being entered by the Chicago, Richmond, Bradford, and Effner divisions of the Pittsburg, C., C. & St. L. R.R.; the Michigan division of the Vandalia, and its 94-mile branch northeast to Butler; and by the Wabash. It is also the western terminal of the interurban line operated by the Fort Wayne & Wabash Valley Traction Company, and the northern terminal of the line operated by the Indiana Union Traction Company.

Industries. The business of the city is derived largely from its railroad shops (those of the P., C., C. & St. L. employing 1,000 men, the largest industry), from its manufactories, and from the surrounding agricultural region, the chief products being wheat, corn, oats, and small fruits. An important industry is the Western Motor Works, manufacturers of automobile and other motors, and gray iron, brass, and aluminum castings. Kenneth quarries, two miles west of the city limits on the north bank of the Wabash, furnish large quantities of crushed limestone.

Banks and Publications. Logansport has two national banks, one state bank, and one trust company, with a combined capitalization of $650,000, and one private bank not capitalized. There are published three daily, two semi-weekly, and five weekly newspapers, including one German paper.

Churches and Educational Institutions. The city has 16 Protestant and three Catholic churches. Its educational facilities are embraced in the Logansport Business College, Holy Angels' Academy (R. C.), a high school, the building being of Lake Superior red sandstone, and 8 ward schools, in addition to the Catholic and Lutheran parish schools.

Public Institutions, etc. Of these the most important is the Northern Indiana Hospital for the Insane, popularly known as «Longcliff,» comprising 34 buildings, and 300 acres of land, at a total cost of $724,164.76, and opened 1 July, 1888. Saint Joseph's Hospital (R. C.), the Home for the Friendless, the Orphans' Home, the Carnegie Library erected in 1904 at a cost of $35,000, the Federal building completed in 1905 and costing $75,000, and the Masonic Temple, are among the more prominent institutions. The city also has three parks, Spencer Park, about a mile east of the city limits, Riverside Park on the Eel River, and Court Park. The Soldiers' Monument in Mount Hope Cemetery, costing $10,000, was dedicated 14 July 1887. The Logansport Home Telephone Company has 2,000 telephones and extensive connections with other places and the rural districts.

History, Government, and Population. Logansport was named after Captain Logan, a Shawnee chief, killed by the Indians in Nov.

1812, near the Maumee River, and was first written Logan's Port. The first permanent settlement was made in August 1826, by Alexander Chamberlain, who erected a log cabin on the south bank of the Wabash, directly opposite the mouth of the Eel River. It was incorporated as a town 5 Sept. 1831; as a city, 3 April 1838. Its elective officers consist of a mayor, judge, clerk, and treasurer, each for four years, ineligible for two consecutive terms; and seven councilmen, one from each of the five wards, and two at large. The business of the city is largely delegated to its Board of Public Works, which consists of three members, appointed by the mayor, and not more than two of which can belong to the same political party. The three police commissioners are appointed by the governor. The city also owns and operates its own electric light and water plant. Pop. (1890) 13,328; (1900) 16,204.

Charles O. Fenton,
Editor 'Logansport Times.'

Log'arithms. The common logarithm of a number is the index of the power to which 10 must be raised to be equal to the number. Thus $10^3 = 1{,}000$, so that the logarithm of 1,000 (usually written log. 1,000) is 3. Now $10^1 = 10$, $10^2 = 100$, $10^3 = 1{,}000$, $10^6 = 1{,}000{,}000$, and it is well known that $10^0 = 1$, $10^{-1} = 0.1$, $10^{-2} = 0.01$, etc., thus:

Log. 0.001 = −3	Log. 10 = 1
Log. 0.01 = −2	Log. 100 = 2
Log. 0.1 = −1	Log. 1,000 = 3
Log. 1 = 0	Log. 10,000 = 4

It is evident that the logarithm of any number greater than 1 and less than 10 is fractional; the logarithm of any number greater than 10 and less than 100 is greater than 1 and less than 2. Again, the logarithm of any number less than 1 is negative. The logarithms of numbers have been calculated by Napier, Briggs, Mercator, Newton, Leibnitz, Halley, Euler, L'Huillier, Vlacq, Sherwin, Gardner, Hutton, Taylor, Callet, and others. Of works giving tables of logarithms we may mention those to which the names of Hutton, Callet, and Vega are respectively attached. Chambers' Mathematical Tables is a useful little treatise; it gives logarithms of numbers to seven places of decimals. Suppose we wish to know the logarithm of the number 18.1. In a book of tables we only find the fractional part of the logarithm, it is .257679. Now 18.1 is greater than 10 and less than 100, so that its logarithm is greater than 1 and less than 2; hence log. 18.1 = 1.257679. To give examples:

Log. 18100 = 4.257679	Log. 1.81 = $\underline{0}.257679$
Log. 1810 = 3.257679	Log. 0.181 = $\bar{1}.257679$
Log. 181 = 2.257679	Log. 0.0181 = $\bar{2}.257679$
Log. 18.1 = 1.257679	Log. 0.00181 = $\bar{3}.257679$

$\bar{3}.257679$ means $-3 + 0.257679$. For a full explanation of the finding of logarithms and natural numbers by the tables see treatises on trigonometry, etc. The integral part of a logarithm is called its characteristic, the fractional part its mantissa. Logarithms make arithmetical computations more easy, for by means of a table of them the operations of multiplication, division, involution or the finding of powers, and evolution or the finding of roots, are changed to those of addition, subtraction, multiplication, and division respectively. For instance, if x and y are the logarithms of any two numbers, the numbers are 10^x and 10^y; now the product of these numbers is 10^{x+y}, so that the logarithm of the product of two numbers is the sum of the logarithms of the numbers. Again, the quotient of the numbers is 10^{x-y}; so that the logarithm of the quotient of two numbers is the difference of the logarithms of the numbers. Again, 10^x raised to the nth power is 10^{nx}; so that the logarithm of the nth power of a number is n times the logarithm of the number. Again, the nth root of 10^x is $10^{\frac{x}{n}}$; so that the logarithm of the nth root of a number is $\frac{1}{n}$th of the logarithm of the number. Hitherto we have spoken of common logarithms, which were invented by Briggs; their *base*, as it is called, is 10. Now logarithms were first used by Napier of Merchiston (see Napier, John), and he employed a base which is smaller than 10, it is the number 2.7182818...., or the sum of the infinite series $2 + \frac{1}{2} + \frac{1}{2.3} + \frac{1}{2.3.4} +$, etc. This base is denoted by e in mathematical treatises, and the Napierian logarithm of any number, say 7, is log. $_e 7$, to distinguish it from log. 7, which is the common logarithm, whose base is 10. The common logarithm of a number is found from the Napierian by multiplying by 0.43429448. Napierian logarithms are of great importance in mathematics.

Log'cock, a local name for either of two birds: (1) the pileated woodpecker (see Woodpecker); (2) the woodcock (q.v.).

Log'gerhead Shrike. See Turtle.

Loggerhead Turtle. See Hawksbill.

Loggia, lŏj'ạ, a word used in Italian architecture with several significations. It was applied to a hall open on two or more sides, where there were pillars to support the roof. Such are the Loggia de' Banchi in Genoa, and the Loggia de' Lanzi in Florence. It is also applied to an open colonnade along the side of a building. The name loggia is also given to the large ornamental window consisting of several parts, which is often seen in old Venetian palaces; and lastly, it is used to designate a small airy hall, usually open on all sides, constructed on the roof of an edifice. See also Architecture.

Log'ging, a name given by lumbermen to the practice of rolling logs from whence they are cut, or drawing them on sleds or wagons, to the stream by which they are transported to the mill. In some places logs are thus moved from one point to another by means of flumes and waterways.

Logic, an art which treats of reasoning, together with the operations of the mind subsidiary to reasoning. Its chief end is to ascertain the principles on which all valid reasoning depends, and which may therefore be applied as tests of the legitimacy of every conclusion that is drawn from premises. Thus Whately defines logic as «the science and art or reasoning,» and Whewell says that «by logic has generally been meant a system which teaches us to arrange our reasonings that their truth or falsehood shall be evident in their form.» Hamilton defines it as «the science of the laws of thought as thought.» Some logicians would extend the sphere of logic further than is consistent with any of the definitions just given, and make it coextensive with the science and theory of evidence in the most general sense of that term; but we shall be following the most general usage if we confine it to the study and estimation of such evidence as depends for its sufficiency more or less immediately on some admitted truth which is at least equally general in its nature with that which it is held to prove.

Divisions.—Logic has been divided, according to different principles, into objective and subjective (*Logica systematica* and *Logica habitualis*); into abstract or general and concrete or special (*Logica docens* and *Logica utens*); into pure and modified; and into deductive and inductive. The first of these divisions looks at logic, on the one hand, as a systematized body of truths on the subject of which it treats, and, on the other hand, as the knowledge of these truths which is possessed by an individual, and the ability which that individual displays in applying them. The second division, into abstract and concrete, considers logic in the first case apart from any of its particular applications, and in the second case as applied to some particular art or science. The division into pure and modified logic looks at that science first in its naked theory, and secondly as modified in its application to the search after truth by the mental constitution of man generally or particular individuals; or, in other words, pure logic treats of the laws of correct reasoning and what is connected therewith, and modified logic treats of those circumstances that are likely to lead men into error in reasoning.

Deductive Logic.—As we have already said, it is the function of logic to treat not only of reasoning, but also of the operations of the understanding subsidiary to reasoning. Reasonings come under the examination of logic only as they are expressed in words; thus only can they appear in such a form that their truth or falsehood will be instantly evident, according to the requirements of Whewell's definition of the science. As expressed in words reasonings are composed of judgments or propositions, and judgments are composed of terms, general or particular. Naming and judging are therefore two operations of the understanding, and names and propositions two mental products which, as subsidiary to reasoning, belong to the province of logic.

Laws of Thought.—But before saying anything on these subsidiary operations it is necessary to state the three axioms or fundamental laws of thought which regulate the understanding in all its operations whether of naming, judging, or reasoning, and which are in themselves self-evident. These are, 1, the law of identity; 2, the law of contradiction or difference; and 3, the law of excluded middle. The law of identity expresses the fact that everything is the same as itself: its formula is A is A. The law of contradiction or difference expresses the fact that nothing can be the same as its contradictory: its formula is A is not Not-A. The law of excluded middle expresses the fact that one or the other of two contradictory propositions must be true: It asserts the truth of the formula A is either B or not B. Applying these laws to naming then, we can affirm that every name must be the same as itself; that no name can be thought as expressing contradictory attributes; that no name, for example, is thinkable as expressing at once the attributes of rationality and irrationality; and that of every name we can assert that any attribute either is or is not expressed by it. To these laws some writers add the law of reason and consequent, expressed by the formula, Infer nothing without a reason.

Names or Terms.—It would be impossible without extending the length of this article disproportionately to go very minutely into the theory of naming. It is enough to mention that names are applied to persons or things, either in virtue of certain attributes which they possess, or merely in order to distinguish one individual from another. The former have been aptly called connotative, because they connote (mark together) or express the attributes which constitute their meaning, and they may be applicable either to single individuals (as God, the sun), or to numbers of individuals (as man, horse). The latter are called non-connotative, and are applicable only to single individuals, or if applied to more than one individual, are not applied in virtue of any qualities that these may happen to possess in common. The attributes expressed by a name are called its connotation, and the individuals to which it is applicable its denotation. Some writers, instead of the connotation and denotation of a name, speak of the comprehension and extension of a concept, which is the sum of the qualities expressed by a name. The comprehension of a concept is thus these qualities considered in themselves, and the extension the aggregate of individuals in which these qualities are found to exist.

Judgments.—Judgments or propositions are the forms in which our beliefs are expressed in language. In them we either affirm or deny something to be true of something else. The term expressing that of which the assertion is made is called the subject; that which expresses what is denied or affirmed of the other is called the predicate. Sometimes there is a separate word or phrase to connect the subject and predicate, and to show whether the latter is affirmed or denied of the former. This is called the copula ('is' or 'is not' or 'are' or 'are not.')

Distribution.—The words all, some, etc., showing whether the subject of a proposition is distributed or not, are said to indicate the ***quantity*** of the proposition. Sir W. Hamilton advanced the theory that in every proposition the predicate should have a sign of quantity as well as the subject, so that every proposition should be a perfect equation. This is what is called the doctrine of the quantification of the predicate, but it has not been generally received into the expositions of deductive logic, and has been positively objected to by some logicians as involving a misrepresentation of the nature of a proposition. Propositions the subject of which is distributed are called ***universal*** or ***singular,*** according as the subject is applicable to more than one or to only one individual; those of which it is undistributed, ***particular.*** When there is no sign to indicate whether the subject is distributed or not, the proposition is called ***indefinite,*** in place of which Sir William Hamilton introduced the term ***preindesignate,*** applying the term ***predesignate*** to those in which the quantity was overtly expressed.

Quality.—As judgments are said to differ in quantity according to the distribution or non-distribution of their subject, so they are said to differ in ***quality*** according as they are affirmative or negative; and with reference to both quality and quantity they are divided into four classes — universal (or singular) affirmative, represented by the vowel A; universal negative, represented by E; particular affirmative, represented by I; and particular negative, represented by O. Examples of the four are: All men are liable to err; No man is the exact counterpart of another; Some men are wise; Some men are not wise.

Conditional Judgments.—Hitherto we have only treated of what are called categorical propositions, that is, those in which something is directly affirmed or denied of the subject; but there is another class in which the predication is not direct. Of such propositions there are three kinds, hypothetical, disjunctive, and hypothetico-disjunctive or dilemmatic. ***Hypothetical*** propositions are such as have a condition attached to the predicate, as, If A is B, C is D, or if A is B, it is C. The condition is called the ***antecedent,*** and the proposition whose truth depends upon the condition is called the ***consequent.*** *Disjunctive* propositions are such as in effect, though not in form, affirm the truth of one of two or more propositions, such as, Either A is B, or C is D, or again, A is either B or C or D, the first of which is equivalent to, One of the two propositions A is B, C is D is true; and the second to, One of the propositions, A is B, A is C, A is D, is true. Such propositions are often treated by logicians as if the alternative excluded the possibility of more than one of the propositions being true. The first of the examples given would, according to this rule, be considered as equivalent to, One, and only one, of the propositions A is B, C is D is true; and the second, One, and only one, of the propositions A is B, A is C, A is D is true. But this is quite an uncalled for limitation of the meaning of the phrase disjunctive proposition, and leaves one form of proposition without a name; for judgments in which we assert that at least one of two or more alternatives is true, are often made without the intention of excluding the possibility of more than one being true. It might be said, for example, of a man who had expended great sums of money in projects of questionable utility, that he must either be very wealthy or very foolish, without meaning to state that he could not be both very wealthy and very foolish. Indeed, it would be more proper to regard the latter sense as the true meaning of a disjunctive proposition, inasmuch as that expresses all that is necessarily implied in a proposition of that form. The last kind of indirect proposition, the ***hypothetico-disjunctive*** or ***dilemmatic*** is a compound of both the other two, in some such form as, If A is B, C is either D or E. As a hypothetical proposition affirms (or denies) some predicate of some subject conditionally, a hypothetico-disjunctive proposition affirms (or denies) the truth of one or other of two or more propositions conditionally.

Immediate Inference.—Before we pass from judgments to reasonings, or the doctrine of syllogisms, we have to consider four methods of treating propositions, so as to derive other propositions, the truth or falsity of which is implied in the original propositions. These methods are called processes of immediate inference.

1. *Contraposition.*— The first of these processes is called *contraposition.* Thus, the proposition, All men are mortal, becomes by contraposition, No man is immortal.

2. *Subalternation.*— The second process is through the relation of ***subalternation.*** This relation subsists between universal propositions, whether affirmative or negative, and their corresponding particulars, or between A and I, and between E and O, when the terms of the propositions are otherwise the same. A and E are called ***subalternants*** with reference to I and O respectively, and I and O are called with reference to them ***subalternates.***

3. *Opposition.*— The third process of immediate inference is of somewhat more importance. It depends upon the doctrine of ***opposition.*** The laws of immediate inference bearing upon propositions standing to one another in the relation of opposition are the following: 1. Of two contradictory propositions one must be true, and the other false. If it is true that All A's are B, it must be false that Some A's are not B; if it is false that Some A's are B, it must be true that No A is B. 2. Two contrary propositions may both be false, but they cannot both be true. If it is false that All A's are B, it may nevertheless be equally false that No A is B; but if it is true that All A's are B, it must be false that No A is B; and if it is true that No A is B, it must be false that All A's are B. 3. Two sub-contrary propositions may both be true, but they cannot both be false. If it is true that Some A's are B, it may be none the less true that Some A's are not B; but if it is false that Some A's are B, it cannot be false that Some A's are not B.

4. *Conversion.*— The last process of immediate inference is also important, especially on account of the part in plays in the theory of the syllogism as usually expounded. In every kind of conversion the proposition in its original form is called the ***convertend,*** and the proposition into which it is changed the ***conversa*** or ***converse.*** The law of conversion is that no term must be distributed in the converse which was not distributed in the convertend. Thus the converse of All A = B is, All B = A. No A = B by conversion becomes No B = A, Some A = B is converted into Some B = A, etc.

Ratiocination.— We now come to that which forms the main subject of deductive logic, the theory of ratiocination, or the syllogism. All deductive reasonings, or reasonings from generals to particulars, must necessarily be capable of being stated in the form of a syllogism, and on being so stated their validity will be evident from their form. A ***syllogism*** consists of three propositions, two of which, called collectively the ***antecedent,*** and separately the ***premises,*** state the grounds of the inference deduced; while the third, called the ***consequent*** or ***conclusion,*** states what that inference is. Every syllogism consists of three terms, each of which occurs twice. Of these one occurs twice in the antecedent, once in each premise, and is called the ***middle term.*** The other two occur once in the antecedent, and once in the consequent. That which is the subject of the consequent is called the ***minor term,*** and that which is the predicate the ***major term.*** Both together are sometimes called the ***extremes.*** The premise containing the major term is called the ***major premise*** (by Sir W. Hamilton the ***sumption***). That containing the minor term is called the ***minor premise*** (by Sir

W. Hamilton the ***subsumption***). It is a matter of no consequence to the validity of a syllogism in what order the propositions are given; but in logical treatises the usual order is 1st, major premise, 2d, minor premise, 3d, conclusion; and all logical formulas referring to the syllogism are based on the assumption that its parts are so stated.

Figure.— The syllogism may appear in four different forms, called ***figures,*** according to the position of the middle term, which may be subject in the major premise and predicate in the minor, predicate in both premises, subject in both premises, or predicate in major and subject in minor. These figures are known as first, second, third, and fourth, and are usually represented by the following scheme, in which P (predicate of conclusion) stands for the major term, S (subject of conclusion) for the minor, and M for the middle:

	Fig. 1	Fig. 2	Fig. 3	Fig. 4
Major premise......	M P	P M	M P	P M
Minor premise......	S M	S M	M S	M S
Conclusion..........	S P	S P	S P	S P

The Ground of Validity of Syllogistic Reasoning.— Logicians commonly base the validity of the syllogistic process upon some form of the canon, called the ***Dictum de omni et nullo,*** which in its Latin form reads thus — ***Quicquid de omni valet, valet etiam de quibusdam et singulis; quicquid de nullo valet, valet nec de quibusdam nec de singulis;*** which may be interpreted in English thus: «Whatever is true of a whole class, is true of what is included in that class.»

Mood: Syllogistic Rules.— We have already seen that what determines the figure of a syllogism is the position of the middle term. Another division of syllogisms is determined by the quantity and quality of the propositions of which they are composed. If the four propositions A E I O be taken three together in different order there will be sixty-four sets, and if all these sets made legitimate syllogisms there would be sixty-four moods irrespective of figure. But if we test these sets by rules deduced from the syllogistic canon, we shall find that the great majority of them cannot make legitimate syllogisms. These rules are six in number: 1. In every syllogism there must be three, and only three terms. If this rule were overtly violated the pretended reasoning would not even have the form of a syllogism. 2. The middle term must be distributed in one of the premises. 3. Neither the minor term nor the major must be distributed in the conclusion, if it was undistributed in the premises. The first part of this rule implies that if one of the premises is particular the conclusion must be particular; and the second part of the rule, taken in conjunction with the second rule, implies that from two particular premises no conclusion can be drawn. 4. If both premises are affirmative, the conclusion must be affirmative. 5. If either of the premises is negative, the conclusion must be negative. 6. From two negative premises no conclusion can be drawn.

Let us now apply these rules to ascertain the number of logical moods. Two of them, the sixth and the corollary deduced from the second and third, apply to the premises exclusively, in such a manner as to serve as tests of the possibility of the various pairs of propositions entering into legitimate syllogisms as premises. The number of different pairs of propositions taken in different order is sixteen. They are AA, AE, AI, AO, EA, EE, EI, EO, IA, IE, II, IO, OA, OE, OI, OO. Three of these, II, IO, and OI, are excluded by the corollary to the second and third rules affirming that from two particular premises no conclusion can be drawn; three, EE, EO, and OE, are excluded by the sixth rule forbidding two negative premises; and one, OO, is excluded by both. If we closely examine the pair IE we shall find that it also must be excluded, for it follows from the first corollary to the third rule, and from the fifth rule, that any conclusion derived from these premises must be both particular and negative, that is O. But in such a conclusion the predicate would be distributed, whereas it could not have been distributed in the major premise I, as both terms of it are particular. A syllogism with the premises IE must therefore be a violation of the third rule. There thus remain only eight pairs of premises capable of entering into a valid syllogism, namely AA, AE, AI, AO, EA, EI, IA, and OA. Three of these being universal both in the major and minor, AA, AE, and EA, may give either universal or particular conclusions. The conclusion of the others must be particular. There are thus eleven different sequences of propositions which yield valid syllogisms, AAA, AAI, AEE, AEO, EAE, EAO, AII, AOO, EIO, IAI, and OAO, and if all these could occur in each of the figures there would be forty-four syllogistic moods; but this number is limited by the special rules applicable to the different figures and we must state these rules before we can see what are the valid moods for each.

The rules for the First Figure are three: 1. The minor premise must be affirmative. 2. The major premise must be universal. 3. The quality of the major premise determines the quality of the conclusion, and the quantity of the minor the quantity of the conclusion.

We will again demonstrate one of these rules, say the second, for the sake of illustration. It will be remembered that the formula of the first figure is MP, SM, SP. Now if the major premise is not universal, its subject, the middle term, is not distributed; and as the minor premise by the first of our special rules must be affirmative, its predicate, also the middle term, cannot be distributed The middle term is thus distributed in neither case, and the second general rule is violated. If we apply our special rules then to the eleven model forms we shall find that only four of them, AAA, EAE, AII, and EIO, can be exhibited in the first figure. The two, AAI and EAO, would also yield legitimate syllogisms, but as they infer a particular conclusion when a universal one, in accordance with the rule that the quantity of the minor premise determines that of the conclusion, is warranted, they are not used; and the same applies to two cases in the second and one in the fourth figure.

The rules for the Second Figure are also three: 1. One of the premises must be negative. 2. The conclusion must be negative. 3. The major premise must be universal.

Applying these rules to our eleven model forms we again obtain four valid moods, AEE, EAE, AOO, EIO. AEO and EAO are the two which are rejected as yielding a particular conclusion when a universal one is warranted.

The rules for the Third Figure are two: 1. The minor premise must be affirmative. 2. The conclusion must be particular.

These two rules admit of six valid moods, namely, AAI, EAO, AII, EIO, IAI, and OAO.

The rules for the Fourth Figure have been variously stated, but the three following may be given as the most comprehensive of those that have been devised for it: 1. If the major premise is affirmative the minor premise must be universal. 2. If one premise is negative the major premise must be universal. 3. If the minor premise is affirmative the conclusion must be particular.

These special rules yield the five moods, AAI, AEE, EAO, EIO, and IAI. AEO is rejected on account of its having a particular conclusion when a universal one is warranted.

We now see that there are in all nineteen syllogistic moods, and in one or other of these every categorical deductive reasoning must be expressed before its validity can be tested. The difficulty of retaining these moods in the memory has led various logicians to embody them in mnemonic lines. The most ingenious are those invented in barbaric Latin for the first three figures by Petrus Hispanus, who filled the papal chair with the title of Pope John XX. or XXI. in 1276–7. These lines not only represent by the ordinary vowels the syllogistic moods, but in the second and third figures also indicate by certain consonants the method by which they are to be reduced to syllogisms of the first figure. The mnemonics for the fourth figure are wanting in the lines of Hispanus, because that figure was not recognized by the earliest logicians (as it is still indeed condemned by many on account of its awkward and irregular mode of inference), but they were afterward added in a new line. In their complete form these mnemonics stand thus:—

I. bArbArA, cElArEnt, primæ, dArII, fErIOque:
II. cEsArE, cAmEstrEs, fEstInO, bArOcO, secundæ:
III. tertia dArAptI, dIsAmIs, dAtIsI, fElApOn,
fErIsO, bOcArdO, habet: quarta insuper addit
IV. brAmAntIp, cAmEnEs, dImArIs, fEsApO, rEsIsOn.

The vowels printed in capitals, it will be seen, show the moods of each figure; and for the consonants, the initial one shows that the syllogisms in the three last figures must be reduced to the one beginning with the same consonant in the first; *s* indicates that the previous proposition must be simply converted; *p* that it must be converted *per accidens,* that is, the quantity of the proposition must be changed; *m* that the premises may be transposed (*metathesis* or *mutatio*); and *r* following a vowel indicates that the process to be resorted to is that called *reductio ad impossibile.*

Fallacies.—A section on fallacies or invalid reasonings forms the usual supplement to an exposition of the theory of deductive logic. As a complete statement of the principles of ratiocination must contain tests of the validity of all valid deductive reasonings, every fallacy or invalid reasoning must consist in a violation of one or other of these principles, that is, in a violation of some one or more of the six general laws applicable to the categorical syllogism or of the rules given for regulating the modes of inference in conditional syllogisms. A violation of the first law of the syllogism, that which requires that there shall be only three terms in it, can happen in such a manner as to leave the form of a true syllogism, only when the same middle term is used in different senses in the two premises, that is, when the middle term is ambiguous in meaning — a very common source of fallacy. The violation of the second rule as to the distribution of the middle term in one of the premises is called the fallacy of *Undistributed Middle.* The violation of the third, which says that no term must be distributed in the conclusion if it was not distributed in the premises, is called an *Illicit Process.* If it is the minor term in which the fallacy arises it is called the *Illicit Process of the Minor;* if it is the major term, the fallacy is called the *Illicit Process of the Major.* The fallacies of undistributed middle and illicit process are called *Fallacies of Quantity,* violations of the remaining syllogistic laws (4th, 5th, and 6th) are called *Fallacies of Quality.* For these there are no special names, nor for the violations of the laws relating to conditional syllogisms. These are all the fallacies belonging to the form of ratiocination, which is all that deductive logic has properly anything to do with. See FALLACY.

INDUCTIVE LOGIC. *Definition of Induction.*—Having thus completed our summary of the received exposition of deductive logic we now pass to the other section of the science, to which the name of Inductive Logic is given; and in treating of it we will confine ourselves to the views of J. S. Mill, the writer whom we have already mentioned as the most systematic expositor of that part of logical science. Induction is shortly defined by him as «generalization from experience.» At another place he states more minutely that «it consists in inferring from some individual instances in which a phenomenon is observed to occur, that it occurs in all instances of a certain class; namely, in all which *resemble* the former, in what are regarded as the material circumstances.» Again, Induction is, «without doubt, a process of real inference. The conclusion in an induction embraces more than is contained in the premises. . . . A principle ascertained by experience is more than a mere summing up of what has been specifically observed in the individual cases which have been examined: it is a generalization grounded on those cases, and expressive of our belief that what we there found true is true in an indefinite number of cases which we have not examined, and are never likely to examine.»

Inductive Canons.—We may now proceed at once to state the rules which Mill gives for generalizing from experience, the rules to which he gives the name of Inductive Canons.

I. The first he calls the Method of Agreement, which he enunciates thus: «If two or more instances of the phenomenon under investigation have only one circumstance in common, the circumstance in which alone all the instances agree is the cause (or effect) of the given phenomenon.» He gives the following as the axiom upon which it depends: «Whatever circumstance can be excluded without prejudice to the phenomenon, or can be absent notwithstanding its presence, is not connected with it in the way of causation. The casual circumstances being thus eliminated, if only one remains, that one is the cause which we are in search of: if more than one, they either are, or contain among them, the cause.» The canon is exhibited in the formula *ABC, abc; ADE, ade; AFG, afg;* where *a* may be taken to represent the phenomenon under investigation, and *A* therefore, in accordance with the canon just stated, will be the cause of *a*, as it is the only circumstance in which all the cases in which *a* occurs agree. To illustrate these canons by concrete examples in such a manner as to give anything like a satisfactory idea of their application in scientific inquiry would occupy far too much of our space, and we must therefore refer the reader who is desirous of seeing this done to Mill's own work (System of Logic, Book III, ch. ix). We may, nevertheless, mention as a trifling example of this method, that it is by it that we know that every plant reproduces its own kind. Our knowledge of this fact is an inference from the uniform observation that all plants of a particular species agree in having proceeded from some member of that species, whether by seed, bud, slip, or any other means. This method is of very wide application, but it must be mentioned that it labors under two defects, one of which even invalidates its theoretic accuracy. The first defect consists merely in the difficulty of having the conditions of the method fully satisfied, that is, the difficulty of ascertaining that the cases investigated do agree only in one particular. The other defect arises from the plurality of causes, or from the fact to which attention has already been drawn, that different causes may produce the same effect. This circumstance renders the axiom on which the canon is said to depend false, for although a circumstance which was present, in which a phenomenon occurred, may be absent in another case, in which the same phenomenon occurs, this does not prove that the circumstance in question did not in the first instance produce the phenomenon. It may have been the cause in one case, and something else in another.

II. The second canon is called the Method of Difference, and according to Mill depends on the axioms, «Whatever antecedent cannot be excluded without preventing the phenomenon is the cause, or a condition, of that phenomenon. Whatever consequent can be excluded, with no other difference in the antecedents than the absence of a particular one, is the effect of that one.» The canon itself is this: «If an instance in which the phenomenon under investigation occurs, and an instance in which it does not occur, have every circumstance in common save one, that one occurring only in the former, the circumstance in which alone the two instances differ is the effect, or the cause, or a necessary part of the cause of the phenomenon.» The formula of the canon (the same notation being used) is *ABC, abc; BC, bc. A* must be the cause of *a*. This is by far the most important of the inductive canons, both on account of the extent of its application, and also from its being free to a great extent from the practical difficulties besetting the application of the first method, and altogether free from objection as to its theoretical validity. If the only things that could have produced *a* are ABC, and BC alone are not sufficient to produce it, it follows inevitably that A is at least an indispensable part of its cause. Examples of inference in accordance with this canon are constantly occurring. We may find at least two in the illustration we have already used of the ball on a level surface acted upon by an outward force. It is by the method of difference we know that the motion of the ball across the surface is due to the impact of the other solid body, for before that impact the ball was stationary, but immediately after it began to move, although (as we have supposed) no other change took place in the circumstances. It is also by the method of difference that we know that in the second instance, when the ball was placed upon a rough surface, and acted upon by the same force as in the first, its stopping before it reached the point it had reached in the first instance is due to the roughness of the surface, for that is the only circumstance in which the cases differ.

III. The third of Mill's canons of inductive logic is an attempt to combine the first two, with the object of helping to remove the uncertainty which belongs to the first. It is called the Indirect Method of Difference, or the Joint Method of Agreement and Difference, and is stated thus: «If two or more instances in which the phenomenon occurs have only one circumstance in common, while two or more instances in which it does not occur have nothing in common save the absence of that circumstance, the circumstance in which alone the two sets of instances differ is the effect, or cause, or a necessary part of the cause of the phenomenon.» Its formula is *ABC, abc; ADE, ade; AFG, afg: HBC, hbc; IDE, ide; KFG, kfg.* We may again return to our illustration from vegetable reproduction for an example of this method. If, besides examining the cases in which plants of a certain species are produced, we examine those in which they are not produced, but, we will suppose, some other plants closely resembling them are produced, and find that the circumstances attending the production of these latter differ from those attending the production of the former only in respect of the origin of the seed, bud, slip, or whatever else it may be from which they respectively proceeded, we shall have a case of the joint method of agreement and difference; and our conclusion in the former case will be greatly strengthened. This method is, however, no more theoretically rigorous than the first, for even although we exhaust in the negative set of instances all the antecedents that were found in the positive set except one, yet we can never be sure that that one is the cause as long as the negative instances, besides excluding the one that was found constant in the positive set, include some new circumstance or circumstances besides those that were found in combination with *A* in the positive set, for these new circumstances may have been the very causes why the phenomenon under investigation did not occur. In *ABC, abc, B* may have been the cause of *a*, and in *HBC, hbc, H* may have been the circumstance that counteracted the operation of *B*, so that *a* did not appear: in *ADE, ade, D* may have been the cause of *a*, and may have been counteracted in *IDE, ide*, by *I*.

IV. The fourth inductive canon is called the Method of Residues, and, like the method of difference, is based upon the principle of a complete elimination of all circumstances not connected by way of causation with the phenomenon under investigation. It is this: «Subduct from any phenomenon such part as is known by previous inductions to be the effect of certain antecedents, and the residue of the phenomenon is the effect of the remaining antecedents.' It is by an application of this method that when we know the weight of a vessel and its contents, and also the weight of the vessel alone, we can infer the weight of its contents. This is manifestly equal rigorous in its principle with the method of difference.

V. The last inductive canon is applicable to those cases in which we cannot obtain a case of the method of difference, owing to the impossibility of removing the phenomenon under investigation. Thus we cannot entirely remove heat from a body, and therefore cannot observe the effect of heat by examining some body first without and then with heat. We cannot remove the sun from the solar system, and therefore cannot tell by actual experiment what effect its absence would have. In these circumstances we resort to the Method of Concomitant Variations, which depends on the axiom, "Anything on whose modifications modifications of an effect are invariably consequent must be the cause (or connected with the cause) of that effect." The canon itself is enunciated thus: "Whatever phenomenon varies in any manner whenever another varies in some particular manner is either a cause or an effect of that phenomenon, or is connected with it through some fact of causation." Although we have no opportunity of observing any body absolutely deprived of heat, we can observe the same body at different temperatures. It is in this way that we discover that heat has the effect of expanding bodies, for with no other change than an increase of temperature we see that mercury expands.

Consult: Whately's 'Logic'; some articles on the subject in Sir W. Hamilton's 'Discussions' (second edition, 1853); 'Lectures on Logic' by the same author (1860); Thomson's 'Outlines of the Laws of Thought'; Ueberweg's 'System der Logik und Geschichte der Logischen Lehren' (5th ed., 1882); De Morgan's 'Formal Logic' (in which mathematical principles are applied); Lotze's 'Grundzüge der Logik'; and Minto's 'Logic' (1893). On inductive logic see Sir John Herschel's 'Preliminary Discourse on the Study of Natural Philosophy' (London, 1831); Whewell's 'Philosophy of the Inductive Sciences' (1840); and especially Mill's 'System of Logic' (1843).

Logic, Symbolic. Symbolic Logic, or Mathematical Logic, or the Calculus of Logic,—called also the Algebra of Logic (Peirce), Exact Logic (Schröder), and Algorithmic Logic or Logistic (Couturat),—covers exactly the same field as Formal Logic in general, but differs from Formal Logic (in the ordinary acceptation of that term) in the fact that greater use is made of a compact symbolism—the device to which mathematics owes so largely its immense development.

Formal Logic may be defined as that science which has for its object the complete analysis and systematic presentation of the principles and methods of deductive reasoning, or the type of reasoning in which conclusions are drawn from given premises. It is not concerned with the truth of the premises or of the conclusions, but simply takes care that if the premise is true the conclusion shall be; it is the study of the forms of valid inference without regard to the content or subject-matter of the propositions which are inferred or of those from which the inference is drawn. Symbolic Logic is then that treatment of Formal Logic which employs, instead of many of the words of ordinary language, a system of special symbols which secure not only greater precision and compactness, but also greater generality in its discussions. These symbols, like the symbols of mathematics, form, in reality, a new symbolic language; and it may be said that the choice of a convenient and accurate symbolism has been, in logic as in mathematics, an indispensable condition for the progress of the science.

A partial use of symbolism in Formal Logic is as old as the time of Aristotle; for example, "If both A and B include the whole of C, it follows that some A is B." What is called Symbolic Logic simply carries this device farther; it would express the whole of the above statement in symbols, as, for example, thus: $A \succ C \cdot B \succ C : \prec : A \curlyvee B$. The immense advantage that accrues from the full carrying out of this idea of Aristotle's can only be realized by those who have given some attention to mastering the details of the method.

The thorough-going application to Formal Logic of the symbolic method, with the accompanying extension of the field of logical inquiry, is a development of the latter half of the 19th century. The essential features of the modern theory, to be sure, were known to Leibniz as early as 1700, and some valuable contributions were made by Lambert in 1781; but the first work which brought the possibilities of the symbolic method forcibly to the attention of logicians was 'An Investigation of the Laws of Thought,' by George Boole, in 1854; and Boole is commonly regarded as the founder of the modern science. The new ideas did not at first meet with favor; the logicians, wedded to the classical methods, in which reasoning is carried on by means of living words, refused to admit what they called a mathematical intrusion into their science; while the mathematicians on their side regarded the whole movement as of no possible interest except to logicians. The field remained for some decades a no-man's land between mathematics and logic; the few who cultivated it worked largely without knowledge of previous or contemporary workers in the same field; and the difficulty of defining the relation of logical symbolism to mathematical form, and the limits of the analogy between them, led to many errors. By the end of the century, however, owing to the labors of Peirce and Schröder, the new methods had established themselves on a sound footing, and had proved their value in logical investigations. To mention only e illustration of their power, the Syllogism, and the so-called "laws of thought" (namely, the principle of identity, the principle of contradiction, and the principle of excluded middle), have now been completely analyzed by the symbolic method, with results for which most logicians were not prepared: in the first place, it is now known that the three "laws of thought" are entirely independent of one another, in the sense that no one is a necessary consequence of the other two; secondly, that the principle of the syllogism, in its primitive form, is not a consequence of the other three laws, but must be assumed as a separate principle; and finally that all four of the laws taken together are not sufficient for some of the most elementary processes of mathematical reasoning—that for these an entirely different discipline is required, namely, the Logic of Relations (see below). This example alone is sufficient to justify the assertion that the study of Symbolic Logic has put a wholly new spirit into the Logic of Aristotelian traditions, and has transformed a discipline which had remained nearly stationary since the Middle Ages into one of the most progressive of the modern sciences.

While this development was taking place in Logic, an equally important movement in a similar direction was being carried forward in the field of Pure Mathematics, and a brief account of this movement must be given before we can understand the present position of Symbolic Logic. Up to the middle of the 19th century, mathematics had been so busily engaged in testing the power of the newly acquired calculus of Newton and Leibniz, and obtaining results by its aid, that few inquiries had been made into the logical foundations of the theory. Since that epoch, however, increasing attention has been paid to these fundamental questions, among the early leaders being such men as Bolyai, Lobatchevsky, Cauchy, Weierstrass, Riemann, De Morgan, and Robert Grassmann, all of whom, except the first two, were contemporaries of Boole's. The first result of these inquiries was the recognition, more clearly than ever before, that every mathematical theory is based on a small number of fundamental hypotheses, or postulates, from which all the other propositions of the theory can be deduced, and careful lists of postulates are now being worked out for most of the important mathematical branches. Secondly, it became increasingly evident that the real interest of the mathematician lies not so much in the material content of the hypotheses which he assumes, as in the logical processes by which further propositions are deduced from those hypotheses. The natural outcome of this conviction was an immediate and very great extension of the field of mathematical inquiry. No longer confined to the study of number, quantity, and space, mathematicians invented for themselves new systems of hypotheses, and deduced from them new theories. Any set of postulates would serve, provided they involved no internal contradiction, and in the exuberance of new freedom, the subject-matter was sometimes chosen with an almost playful disregard of practical utility. Perhaps the most striking example of the new tendency was the acceptance of the non-Euclidean geometries of Lobatchevsky and Bolyai as legitimate branches of mathematics. These theories had at first been regarded as heretical, or at least as non-mathematical; but now, when it became clear that their assumptions, though unusual, were still not self-contradictory, they were assigned their proper places as hypothetical-deductive theories; they therefore became as much a part of mathematics as the older theory of Euclid, that theory being itself now recognized as a hypothetical-deductive theory; and the mathematical interest of either theory was seen to be quite independent of the question whether an illustration of it could or could not be found in the world of space-perceptions. Another example is that of Hamilton's quaternions, which is a new algebra in which the fundamental assumptions differ in several respects from the laws which hold in the more familiar algebra of quantity. Similarly, all the host of artificial algebras, the invention of which was promoted especially by Hankel (1867) and Benjamin Peirce (1870), are hypothetical-deductive theories exhibiting varying degrees of divergence from the ordinary algebra of quantity; perhaps the simplest of all these algebras is that invented by Boole himself for the purposes of symbolic logic. In arithmetic and geometry the work of Peano, Padoa, and Pieri in Italy, and of Pasch, Frege, and Hilbert in Germany, should be especially mentioned. Finally, the theory of abstract groups, and the whole operational calculus, are outgrowths of the same tendency. In short, pure mathematics came to be regarded, at the end of the century, as a collection of hypothetical-deductive theories, distinguished from one another by the nature of the assumptions adopted as the basis of each theory, but depending for their mathematical interest not so much on the material content of those assumptions as on the logical relations between the resulting propositions.

As the outcome of these two movements, therefore, the sciences of logic and mathematics found themselves in a wholly unexpected position at the beginning of the 20th century. Instead of being separate, almost antagonistic, disciplines, they suddenly discovered that they were both working in the same direction—that their problems and aims were identical. The field of symbolic logic, which had hitherto occupied a rather uncomfortable position between the two opposing forces, now became the common meeting-ground where mathematicians and logicians can work together to mutual advantage. The researches of Peirce and his pupils in America, and of Schröder in Germany, became more widely known. Peano and his school in Italy began the publication of the 'Formulaire de Mathématiques,' which is intended to become a complete cyclopedia of mathematical knowledge, expressed in the language of symbolic logic. Russell and Whitehead in England, and Couturat in France, became active exponents of the new mathematical-logical theory. Even the strictly mathematical researches of Georg Cantor began to arouse a lively interest among the logicians. Finally, it remained for Russell (1903) to announce the surprising thesis that logic and mathematics are in reality the same science; that pure mathematics requires no material beyond that which is furnished by the necessary presuppositions of any logical thought; and that formal logic, if it is to be distinguished as a separate science at all, is simply the elementary, or earlier, part of mathematics.

It is too early to predict what the final outcome of this new movement will be; the limits of the inquiry are not yet well defined; the terminology and notation are still in an experimental stage; many important matters of detail are likely to remain for some time in debate; but at any rate this much is clear: a new program has been proposed for mathematics and logic, and the true nature and scope of what is now called symbolic logic cannot be finally determined until this broader question of the relation between logic and mathematics is decided. It may be that, in the merging of these two sciences, no place will be left for symbolic logic as a distinctive science; it may be that the studies now pursued under that name will be supplied with a more appropriate title; or it may be that some new form of symbolic logic will absorb the whole of logic and mathematics.

In view of these considerations it is clear that any account of the subject which can be given at the present time must be regarded as tentative and transitional—a snap-shot at a rapidly moving phenomenon—certain to become obsolete with the change of perspective which is taking place in all our mathematical-logical notions. The sketch which now follows, after this long introduction, must therefore be understood as containing not a body of universally accepted facts, but merely the writers' individual selection of some of the results which, in their view, seem most likely to become of recognized value.

The main results which Symbolic Logic claims to have secured are briefly the following:

1. A thorough-going investigation into the foundations of Logic,—an enumeration of appropriate groups of first principles (axioms and postulates) and the deduction from them of the whole structure.

2. The furnishing of a wonderfully concise and compact method of expressing premises and deductions from premises. It is impossible to overestimate the mastery which this gives over trains of thought.

3. A method for putting any number of premises, of any degree of complexity, into the intellectual mill, and extracting *all* the information which they convey about any term or any combination of terms, without the fatigue of conscious reasoning. Machines have been devised, like Jevons' «Logical Piano,» by which these conclusions can be reached (not, however, in interesting forms) without even the aid of paper and pencil. The only difficulty is to find any *real* problems that are hard enough for this branch of the subject to attack.

These results have been due to:

(*a*) The generalization of the relation *is*, *implies* (made possible by the convention that «all a is b» does not involve the existence of a; this generalization is due to Leibniz).

(*b*) The introduction of the logic of *and* and *or* (there is no reason why Logic should not discuss, e.g., equivalences—perfectly common in real life—such as «The undevout astronomer is mad = Any astronomer is either mad or else devout»).

(*c*) The introduction of the Special Terms, 0 and ∞ (nothing and everything, or the non-existent and the existent).

(*d*) The excision of the non-valid syllogisms, and hence the reduction of valid syllogisms to a perfectly symmetrical collection, all (universal and particular) tested by *one* simple and easy rule.

(*e*) The introduction of an appropriate symbolism.

As has already been intimated, much of the new matter of modern Logic has no necessary connection with its symbolism. The first four of the above improvements could perfectly well have been attained without its use; that they were not, is the greater proof of the utility and power of the symbolic method.

For the purposes of more detailed exposition, the subject may be divided into three parts:

(1) The Logic of Classes or Concepts;
(2) The Logic of Propositions; and
(3) The Logic of Relations;

although this can hardly be called a scientific division. (The use to which the term «Algebra of Logic» is now commonly restricted will be explained below.)

1. *The Logic of Classes or Concepts.*—In conducting any scientific inquiry, we usually, whether consciously or unconsciously, confine our attention to a particular realm of thought, which may be called the universe of discourse, or simply the *universe*, for that particular inquiry; any object outside the universe is irrelevant to the discussion. For example, astronomy deals with the universe of material objects on a large scale; anthropology deals with the universe of human beings; botany deals with the universe of flowers and plants; etc., etc. This universe, in any particular discussion, is represented by the symbol ∞, or by the symbol 1.

Within any given universe, we have to speak of classes, a *class* being a group of objects of thought which are distinguished in any way from the rest of the universe. The objects belonging to a class are usually characterized by the possession of certain common characters in which we are interested; and of these characters we then may form a «concept.» But in Symbolic Logic we view a class merely as (in any way whatever) distinguished from the other classes of the universe.

Any class is represented in Symbolic Logic by a letter of the alphabet, and the complementary class, comprising all the rest of the universe, by the same letter with a dash or accent. Thus, in the universe of men, we may let a = the class of Americans, b = the class of bankers, and c = the class of Californians; then a' will represent the class of all foreigners, b' the class of all non-bankers, and c' the class of all men who do not live in California. Of course it is possible at any time to enlarge the borders of our universe, so that, for example, b' may come to mean not only all men who are not bankers, but also all things of any kind which are not bankers, as microbes, demonstrations, virtues. In any case, two classes x and x' together exhaust the universe considered, and have no part in common; either of two such classes is called the *negative* of the other. When a criterion, or means of distinguishing the objects of a class x from the rest of the universe, is so defined that no object in the universe will satisfy this criterion, it is convenient to speak of x as an «*empty*» or «*null*» *class.* Any null class is represented by the symbol 0. Thus, the class of all plane figures which are at the same time round and square, and the class of all prime numbers which end in the digit 4, are examples of null classes.

The common part of two classes x and y is represented by xy, and is called their *logical product.* Thus, in our example, ab = the class of American bankers, $a'b$ = the class of foreign bankers, $a'c$ = the class of foreign Californians (this last being of course a null class).

The class composed of two classes x and y together (whether or not these classes overlap) is represented by $x+y$, and is called the *logical* *sum* of x and y. Thus, $a+b=$ the class containing all Americans and all bankers; $a+a'b$, or the class containing all Americans and all foreign bankers, is of course the same class.

When two classes x and y are given, it may happen that every element of x is also an element of y; this relation is represented by $x \prec y$, and is the *fundamental relation* which may exist between two classes. Thus, in our example, $c \prec a$, since every Californian is also an American. If it happens that $x \prec y$, and at the same time $y \prec x$, we write $x=y$; that is, the symbol $=$ in logic is merely an abbreviation for two reciprocal relations $\prec$ between the terms which it connects.

Obviously $x \prec \infty$, whatever x may be; if it happens also that $\infty \prec x$, then and then only it will follow that $x=\infty$. Similarly, the equation $x=0$ is equivalent to the two relations $0 \prec x$ and $x \prec 0$, the first of which, like $x \prec \infty$, is tautologous, being true for every value of x.

We give next, without proof, a list of the principal theorems which have been discovered concerning the fundamental notions represented by ∞, 0, x', xy, $x+y$, and $x \prec y$. (The names attached to some of the theorems are the outgrowth of a varied and uncertain history, and do not always suggest very clearly the meaning of the theorem.)

1. $a \prec a$. (Principle of identity.)

2. If and only if $a \prec b$ and $b \prec a$, then $a=b$.

3. If $a \prec b$ and $b \prec c$, then $a \prec c$. (Principle of the syllogism; see also theorems 22 and 23, below.)

4. $a+a=a$ and $aa=a$. (Tautology.)

5. $a+ab=a$ and $a(a+b)=a$. (Absorption.)

6. $a+b=b+a$ and $ab=ba$. (Commutative laws.)

7. $(a+b)+c=a+(b+c)$ and $(ab)c=a(bc)$. (Associative laws.)

8. $a+(bc)=(a+b)(a+c)$ and $a(b+c)=(ab)+(ac)$. (Distributive laws.)

9. $a \prec a+b$ and $ab \prec a$. (Simplification.)

10. If $a \prec y$ and $b \prec y$ then $a+b \prec y$; and if $x \prec a$ and $x \prec b$, then $x \prec ab$.

11. If $a \prec bc$, then $a \prec b$ and $a \prec c$; and if $b+c \prec a$, then $b \prec a$ and $c \prec a$.

12. If $a \prec b$, then $a+b=b$ and $ab=a$.

13. If $a \prec b$ and $x \prec y$, then $a+x \prec a+y$ and $ax \prec ay$.

14. $0 \prec a$ and $a \prec \infty$.

15. $a+0=a$ and $a\infty=a$.

16. $a+\infty=\infty$ and $a0=0$.

17. $aa'=0$ and $a+a'=\infty$. (Principle of contradiction, or exclusion; and principle of excluded middle, or exhaustion.)

18. If $x \prec a$ and $x \prec a'$, then $x=0$; and if $a \prec y$ and $a' \prec y$, then $y=\infty$.

19. $(a')'=a$. (Double negation.)

20. If $a \prec b$, then $b' \prec a'$. (Contraposition.)

21. $(a+b)'=a'b'$ and $(ab)'=a'+b'$. (De Morgan's Theorems.)

22. If $ax+bx'=0$, then $ab=0$.

23. If $(a+x)(b+x')=\infty$, then $a+b=\infty$. (Theorems 22 and 23 are other forms of the principle of the syllogism.)

24. $\infty \not\prec 0$. (Postulate of existence.)

25.
$$\begin{aligned}\infty &= a+a'\\ &=(a+a')(b+b')\ \ldots\\ &=ab+ab'+a'b+a'b'+\ldots\\ &=abc+a'bc+ab'c+\ldots\end{aligned}$$
and $\quad 0=aa'=aa'+bb'=aa'+bb'+cc'+\ldots.$
(Formulæ for the complete development of ∞ and 0.)

26.
$$(pab+qa'b+rab'+sa'b')'=\\ p'ab+q'a'b+r'ab'+s'a'b'.$$
(Formula for obtaining the negative of a well-developed expression,—of great utility in the solution of problems.)

In verifying the truth of these theorems, the familiar Eulerian circles may render some service by exhibiting to the eye the relations of the several terms; but Euler's diagrams become inadequate and even misleading in any really fundamental discussion, because they fail to represent satisfactorily the negative term, the complete introduction of which into modern logic is one of the most important enlargements of the subject. A better method of diagrammatic representation has been proposed by Venn (*loc. cit.*).

2. *The Logic of Propositions.*—We now turn to the second division of our subject, which will prove to be not a separate branch of the theory, but merely another aspect of the branch already considered.

In this branch of the subject, letters are used to represent not classes, but propositions, and the notation $x \prec y$ is used to express the relation: ‘the proposition x *implies* the proposition y,’ or ‘the truth of x entails the truth of y.’ For example, if $p=$ the proposition that John Smith endorsed this protested note, and $q=$ the proposition that he is liable for its payment, then $p \prec q$. Here, as in the logic of classes, the notation $p=q$ is used to express the double relation $p \prec q$ and $q \prec p$. When p is any proposition, then p', or p with a dash above it, represents the proposition contradictory to p, which is called the *negative* of p.

The notation pq, called the *logical product* of p and q, represents a proposition the assertion of which is equivalent to the simultaneous assertion of the propositions p and q; and $p+q$, called the *logical sum* of p and q, represents a proposition the assertion of which is equivalent to the alternative assertion of the propositions p and q. For example, if $p=$ ‘the testator was of sound mind,’ $q=$ ‘he acted freely,’ and $r=$ ‘his will is admitted,’ then $pq \prec r$, since the simultaneous assertion of p and q is sufficient to prove the truth of r (or, in the contrapositive form of the statement, $r' \prec p'+q'$); it happens that in this particular case we have also $p'+q' \prec r'$ (or its equivalent, $r \prec pq$), since if either p or q is false, the will is disallowed. Hence we may embody the complete statement of the situation in the equations $pq=r$ (or $p'+q'=r'$); but it must be constantly borne in mind that every such equation stands for the simultaneous assertion of two statements, the one a sufficient and the other a necessary condition.

Finally, the symbol ∞ is used in this theory to represent any typical true proposition, such as $2+2=4$; and the symbol 0 is used to represent any typical false proposition, such as $2+2=5$. These symbols enable us to express the assertion of the truth or falsity of any proposition as follows: $\infty \prec p$ is equivalent to the assertion ‘p is true’; and $p \prec 0$ is equivalent to the assertion ‘p is false.’ Obviously $0 \prec x$ and $x \prec \infty$, whatever the value of x; so that the relations $\infty \prec p$ and $p \prec 0$ may be replaced by $p=\infty$ and $p=0$, respectively. Two propositions, p and p', will be contradictory when and only when $p+p'=\infty$ and $pp'=0$.

If now we proceed to give the theorems which hold concerning the notions we have just represented by ∞, 0, x', xy, $x+y$, and $x \prec y$, we shall find that all the theorems 1–26 given in the previous section for the theory of classes hold also here, if the symbols are interpreted according to the theory of propositions. For example, the theorem: ‘If a class a lies within the common part of two classes b and c, then it lies within b and also within c,’ and the theorem: ‘If a proposition a implies the simultaneous assertion of the propositions b and c, then it implies a and also implies b,’ are each expressed by the same symbolic form, namely (11): ‘If $a \prec bc$, then $a \prec b$ and $a \prec c$.’ And so for each of the other theorems. This remarkable similarity between the theory of classes and the theory of propositions was stated by Leibniz, but was first fully developed by Boole.

As a most interesting example of the way in which compound propositions can be handled by the Logic of Propositions, we mention Mrs. Ladd-Franklin's ‘inconsistent triad’:

$$(ab=0)(b'c=0)(ac\neq 0)\prec 0;$$

since this is the form to which all the 8192 valid syllogisms (both universal and particular) can be reduced. By transposing the third factor, we have the universal syllogism: $(ab=0)(b'c=0)\prec(ac=0)$; and by transposing the second factor we have the particular syllogism: $(ab=0)(ac\neq 0)\prec(b'c\neq 0)$; the ‘inconsistent triad’ thus furnishes a perfectly general rule for testing the validity of any syllogism.

The Logic of Classes and the Logic of Propositions are included together in the ‘Algebra of Logic’ of Peirce and Schröder; in recent years, however, the term ‘Algebra of Logic’ has come to be used in a more mathematical sense, which will be explained in the following section.

The Algebra of Logic, strictly so called.—If we define *terms* in general to be any objects of thought which can be elements of an asserted relation—whether simple terms, like classes or concepts, or compound terms, like propositions, relations between propositions, etc.—we may say that the logic of classes and the logic of propositions have, formally, the same fundamental notions to deal with, namely: (1) terms, represented by letters of the alphabet; (2) two special terms, 0 and ∞; (3) three functions of terms: negations (x'), sums ($x+y$), and products (xy, or $x\times y$); and (4) the primitive relation between terms, expressed by $x\prec y$, which may itself (in its non-assertive form) be a term of a compound proposition; moreover, the theorems 1–26 are true formulæ in the one theory as well as in the other.

The theorems 1–26 are therefore capable of at least two interpretations: first, in the theory of classes, and secondly, in the theory of propositions; and there are doubtless many other theories also in which these formal statements can be given a concrete significance. It therefore becomes a natural inquiry to investigate this body of theorems in their abstract form (that is, without specifying any interpretation for the symbols), to study the logical relations that exist among them, and to select certain of them as fundamental, from which all the others can be deduced as formal consequences. The body of theorems so considered, with their consequences, forms a mathematical algebra, called (in distinction from the algebra of quantity, the algebra of complex numbers, the algebra of abstract groups, etc.) the *algebra of logic*. The algebra of logic bears the same relation to the ordinary algebra of quantity that the non-Euclidean geometries bear to the ordinary geometry of space; and it has been the analogy between the algebra of logic and the algebra of quantity that has led to the importation of several mathematical terms into the study of symbolic logic (as ‘zero,’ ‘sum,’ ‘product,’ etc.). The study of the algebra in this abstract form has brought out relations between the propositions of logic which might perhaps otherwise have remained unnoticed. As an example, it has been shown that the six fundamental notions: ∞, 0, x', xy, $x+y$, $x\prec y$ are not independent of one another, but that all may be defined in terms of any one of the last three; thus, theorems 15, 16, 17, and 12 may be used as definitions of ∞, 0, x', and $\prec$ in terms of $+$ and $\times$; while theorems 9 and 10 show how ab and $a+b$ can be defined in terms of $\prec$. Indeed it is hard to see how questions of the independence of the fundamental notions could have been discussed at all without the aid of the abstract algebraic method.—The most readable expositions of the algebra of logic from its mathematical side are given by Whitehead and Couturat (see bibliography). A searching inquiry into the nature of the algebra, and its relation to other branches of mathematics, was begun by Kempe in 1890, and has recently been carried farther by Royce (1905).

The Logic of Relations.—The Logic of Relations, or the Logic of Relatives, was founded, as regards first principles, by De Morgan (‘Trans. Camb. Phil. Soc.,’ vol. 10, 1864), developed by Peirce, carried further by Schröder, and has now met with what is possibly a farther important development in the hands of Russell (1903). We can give, in this space, only a cursory account of the principal terms which are employed.

In many inquiries we are concerned with the relation in which some term stands to some other term; for example, a number x may be less than a number y; a person A may be a debtor of a person B; a circle M may lie within another circle N: the notions ‘less than,’ ‘debtor of,’ ‘within,’ are *relations*. Every relation has a *converse* relation. For example, if x is less than y, then y is greater than x; if A is a debtor of B, then B is a creditor of A; if M lies within N, then N includes M. It is customary to represent a relation by a capital letter, as R, and the inverse relation by the same letter with a curved dash above it, as $\breve{R}$. Thus, if R stands for ‘less than,’ and $x=3$ and $y=5$, we have: xRy and $y\breve{R}x$. Again, if R stands for ‘parent of,’ $\breve{R}$ will stand for ‘child of.’

If xRy and ySz, then x stands in a certain relation to z, called the *relative product* of the relations R and S and denoted by RS. Thus if xRy stands for ‘x is brother of y,’ and ySz for ‘y is father of z,’ then $xRSz$ will signify ‘x is uncle of z’; or again, $xRSz$ may mean ‘x is an agent of a landlord of z’; etc.

If a relation R is such that xRy always implies yRx, then R is called a *symmetrical* relation. For example, the relations «equal to,» «different from,» «spouse of,» are symmetrical relations. If R is such that yRx is false whenever xRy is true, then R is called an *asymmetrical* relation; as «less than,» «father of,» etc. Relations like «sister of,» which are neither symmetrical nor asymmetrical, are called simply not-symmetrical.

A relation R which is such that xRx for every value of x is called a *reflexive* relation, like the relation of equality, or the relation which we have denoted by $\prec$ in the preceding part of this article (see theorems 1 and 2).

Again, if a relation R is such that xRy and yRz together always imply xRz, then R is called a *transitive* relation. For example, «less than,» «less than or equal to,» «ancestor of,» etc., are transitive relations. The asymmetrical transitive relations are more important than any other relations in the exact sciences; for example, «less than,» «below,» «before,» «prior to,» are relations of this type. The recent paper by Royce, however, shows how the theory of these asymmetrical relations can be made to depend on the theory of a certain more fundamental symmetrical relation.

In conclusion, we may notice that the whole theory of arithmetical operations, like addition and multiplication, may be regarded as a part of the theory of relations; for, as M. Bôcher has pointed out, instead of saying: «two numbers a and b determine a third number c, called their sum,» we may say: «the three numbers a, b, and c satisfy a certain relation, say $R(a, b, c)$.» Relations of this type are more complicated than those described above, since they hold not between two terms, but between three or more terms.

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Log'os (Greek *λόγος*, from *λέγειν*, to speak), word, language, speech in general. Language being peculiar to man as a reasonable being, and speech presupposing thought, *logos* signifies reason, the faculty of thinking in general. Thus *logos* has the meaning both of thought and utterance. In Christian theology this term, as used in certain passages of the Scriptures, has been the source of continual disputes ever since the 3d century of our era. The passage in the Bible which gives rise to this discussion is the opening of the Gospel of St. John: «In the beginning was the Word, and the Word was with God, and the Word was God. The same was in the beginning with God. All things were made by him, and without him was not anything made that was made,» etc. In the Greek text the expression here translated «Word» is *logos*. What is here to be understood by *logos*, what is its essential character, whether it is a person of the Deity or not, the creative intellect of God, or the Son, through whom he created, or the divine truth which was to be revealed, etc., this is not the proper place to examine, nor will our limits permit us even to enumerate the different opinions which have been entertained on this interesting point of Christian metaphysics. We can refer the reader to no better source of information than Neander's ‹General History of Christianity and the Church.› The generally received doctrine of the *logos* makes it a person and not a mere name, and maintains that the Word is called *God*, not by catachresis, but in the strict and rigorous meaning of the term; that the most ancient Fathers of the Church always taught the divinity of the Word, and that they derived the idea from the Holy Scriptures alone, and not from the Platonic philosophy as many have asserted. On the contrary, it is held that the Hebrew conception of the *logos* is of independent origin, though it was natural that in the New Testament the Greek word should be adopted to express it. Some of the opinions of modern theologians on the meaning of the *logos* are as follows: It is necessary, some say, in order to understand the true meaning of *logos*, to begin with the examination of Wisdom (*sophia*), which was previously used to express the same notion. (See the Book of Proverbs, viii. 1, seqq., and the Book of Wisdom, vii. 22, seqq.) The poetical author of the Proverbs does not imagine a person separate from God, but only an interior power of God, because in his time there could be no idea of a being proceeding from God, the Jews having borrowed this notion at a later period from the oriental doctrine of emanations. The author of the Book of Sirach (xxiv. 3) first uses «The Word» (*logos*) of God as equivalent to «Wisdom» (*sophia*), to signify the almighty power of God. The Word being an act of wisdom gave rise to the symbol. John speaks of the *logos* in the beginning of his Gospel only, and afterward uses the expression *pneuma tou theou*. From his representation, the following positions have been deduced: the *logos* was (a) from the beginning of all thing (comp. Proverbs viii. 22; Sirach xxiv. 9); (b), from the beginning with God (comp. Sir. i. 1; Wisd. Sol. x. 16; ii. 14; Sir. xxiv. 12). St. John, therefore, says those who thus interpret him, had the same idea of the *logos* as the apocryphal writers; for the circumstance that the latter ascribe to the *logos* the creation of all things, while St. John leaves this point undecided in his *en archē ēn* (in the beginning was), does not amount to a contradiction. Others, particularly the earlier commentators, understand by *logos* the Deity himself, that is, the second person of the Deity (according to St. John viii. 58). But those who adhere to the former opinion maintain that this is in contradiction to John xiv. 28; xii. 49, 50; v. 19, 20; and that he understood by *logos* only a power of God, which was communicated to Jesus, on account of which he could claim divine attributes and yet call the Father, as the source of this power, greater than himself. Others, as Herder, Paulus, Eckermann,' understand by *logos* the Word of God, which, in the Old Testament, as the expression of the will of God, is the symbol of his creative power (Gen. i., et seq.). The later Jews represented the divine omnipotence by the Word of God. But it is maintained, on the other hand, from the manner in which John speaks of the *logos*, that he understood by it not merely omnipotence, but the Omnipotent. Others following the Fathers of the Church, particularly Eusebius, understand by *logos* an independent substance, external from God, like the *nous* (intellect) of Plato. But this again, it is said, involves an error, because Plato means by *nous* only a power of God. Still others, as Mosheim, Schlegel, Jerusalem, declare with Irenæus the *logos* of St. John to be identical with the *logos* of the Gnostics; but it is objected that John did not conceive of a plurality like that in the doctrine of æons. Lange considered *logos* equivalent to the *sophia* of the Old Testament, and that to the *logos* of Philo, and as a distinct person from God; but, say the others, *sophia* is not something distinct from God. Paulus, in his Commentary, also identifies the *logos* of Philo with that of St. John. But it is said, on the other hand, that John cannot be supposed to have been acquainted with Philo's notion, as it was not an opinion current at the time, and that the view of the apocryphal writers is more in harmony with his; moreover, that if St. John means anything more than an original, external power in God, his «was God» (St. John i. 1) would imply dualism. Döderlein and Storr translated the word *logos* by *doctrina*, the abstract being put for the concrete, *doctrine* for *teacher*, as in Gen. xlii. 38; 2 Sam. xxii. 23; Luke iv. 36. According to others, *ho logos* means *ho legomenos* (the promised). The ancient philosophers often distinguish two *logoi* an interior in God or man which merely thinks (*logos endiathetos*), and an exterior or uttered (*logos prophorikos*).

Log'wood, the heart-wood of the *Hæmatoxylon Campechianum*, a leguminous tree which grows wild, in moist places, along the eastern shores of Mexico and Central America. From its abundance in some parts near the Bay of Campeachy it is sometimes called *Campeachy-wood*. The leaves are pinnate; the flowers small, yellowish, and disposed in axillary racemes at the extremity of the usually spinous branches. The wood is red, tinged with orange and black, so heavy as to sink in water, and susceptible of receiving a good polish; and it yields an extract much used in dyeing. (See DYES.) Though cultivated to some extent in Jamaica, the logwood of commerce is chiefly obtained from Honduras, where the cutting of it forms an extensive but unhealthy branch of business. Haiti and San Domingo also produce much. The finest kind comes from Campeachy, the inferior qualities from Honduras and Jamaica, to which island it is not indigenous, but where it grows abundantly since its introduction. In the preparation of this wood for use, the trees, which are from 20 to 50 feet high, are cut down, the bark and alburnum removed, and the hard centre parts cut up into 3-foot-long logs. It is afterward hewn into much smaller pieces, and ground or rasped to small chips. The aqueous extract is muddy and of a reddish-brown color. By acids the red color is made paler; by alkalies it is converted to purple. Salts of iron, aluminum, and lead give precipitates of a blue, violet, or purple color. Logwood is chiefly consumed in dyeing cotton cloth, silk, wool, and leather; by mordanting the fabric with iron, black is produced; with alumina, violet and lilac; with copper, blue; and with chromium, a black or green—the exact tint depending on the composition of the mordants and logwood liquors, and the mode of application. The coloring power of logwood depends chiefly on a crystalline ingredient called *hæmatoxylin* (q.v.). In medicine both the extract and the decoction of logwood are used to some extent. The former is prepared by exhausting the wood with boiling water, filtering, and evaporating to a thickish syrup; the latter is the watery extract of the wood along with some cinnamon. Both are used as astringents in diarrhœa and dysentery.

Lohengrin, lō'ĕn-grĭn, the hero of an old German poem, written in the end of the 13th century. Rückert's edition (1857) of the poem is the best. The poem is a continuation of Wolfram von Eschenbach's ‹Parzival.› Wagner made it the subject of his great opera, ‹Lohengrin› (1848).

Loire, lwär (anc. *Liger*), France, the largest river of the country, dividing it into two nearly equal portions. It rises on the western slope of the Cévennes, in the department of Ardèche, and flows generally northwest and west to its outlet in the Bay of Biscay below Nantes. Its principal affluents on the right are the Arroux, Nièvre, Maine, etc.; on the left the Allier, Vienne, Cher, Indre, etc. Below Nantes, it is more a tidal estuary than a river, and is studded with islets. Above Nantes navigation is much impeded by shallows. Its whole course is about 645 miles, of which about 450 miles are navigable. The river is subject to disastrous inundations, and dikes (levées) have been constructed along its course. It is connected by canals with the Saône, Seine, and Vilaine.

Loki, lō'kē, in mythology, the god of strife and spirit of evil. He artfully contrived the death of Balder, when Odin had forbidden everything that springs «from fire, air, earth, and water» to injure him. The mistletoe not being included, was made into an arrow, given to the blind Höder, and shot at random; but it struck the beautiful Balder and killed him. This evil being was subsequently chained with 10 chains, and will so continue till the twilight of the gods appears, when he will break his bonds; then will the heavens disappear, the earth be swallowed up by the sea, fire shall consume the elements, and even Odin, with all his kindred deities, shall perish.

Lokman, lŏk-män', a name that figures in the proverbs and traditions of the Arabians. According to tradition Lokman was a scion from the stock of Ad, and was once sent with a caravan from Ethiopia to Mecca to pray for rain in a time of great drought. But God's anger destroyed the whole family of Ad except Lokman, the only righteous one, whereupon the Creator of the world gave him his choice to live as long as the dung of seven gazelles, which lay in an inaccessible hole in a mountain, should last, or for a period equal to the lives of seven successive vultures. Lokman chose the last, and lived for an almost incalculable length of time. The fables bearing the name of Lokman were for the first time made known to Europe through the press in 1615. They were first published in Arabic, with a Latin translation, were afterward appended to an Arabic grammar, published by Erpenius at Leyden, and have since gone through many editions. The most complete manuscript of the fables of Lokman is in the library of the Vatican, in Persian.

Lola Montez. See Montez, Lola.

Lolach. See Lepidosiren.

Lollardism, lŏl'ạr-dĭzm, in Great Britain, the tenets of the followers of John Wyclif. The views of Wyclif underwent a process of development as his researches and experience extended, and were by no means the same at all periods of his life. In so far as they departed from Roman Catholicism, they approached and, in some cases, went beyond what subsequently became the doctrine and discipline of Calvinism or Puritanism, commingled with an antagonistic element, Erastianism. Among the articles pronounced «heretical» by an assembly of ecclesiastical notables, convened in London in 1382 by Wm. Courtnay, archbishop of Canterbury, were these:

"1. That the substance of material bread and wine doth remain in the Sacrament of the Altar after consecration.

"3. That Christ is not in the Sacrament of the Altar truly and really in His proper corporeal person.

"5. That if a man be only contrite, all exterior confession is to him superfluous and invalid.

"7. That it hath no foundation in the Gospel that Christ did ordain the mass.

"8. That if the Pope be a reprobate and an evil man, and consequently a member of the devil, he hath no power over the faithful of Christ given to him by any, unless, peradventure, it be given him by the emperor.

"9. That after Urban VI. none other is to be received as Pope, but that Christendom ought to live after the manner of the Greeks under its own laws.

"10. That it is against the sacred Scriptures that ecclesiastical persons should have any temporal position."

Among 14 articles adjudged to be «erroneous» were the following:

"13. That a prelate or bishop excommunicating a cleric who hath appealed to the king or the council of the realm, in doing so is a traitor to the king and the realm.

"15. That it is lawful for any deacon or presbyter to preach the Word of God, without the authority or license of the Apostolic See, or of a Catholic bishop or of any other recognized authority.

"17. Also that temporal lords may at will take away their temporal goods from churches habitually delinquent.

"18. That tithes are pure alms, and that parishioners may for the offenses of their curates detain them, and bestow them on others at pleasure, and that tenants may correct delinquent landlords at will.

"24. That friars are bound to get their living by the labor of their hands, and not by begging.

See also Dollards.

Lollards, lŏl'ạrdz, a name which arose in the Netherlands in the 14th century, and which during that and the following century was applied somewhat indiscriminately as a term of contempt to various sects or fraternities deemed heretical by the Roman Catholic Church. Different accounts are given of the derivation of the name. According to one opinion the name was first applied to a fraternity formed about the year 1300 at Antwerp, the members of which devoted themselves to the care of the sick and the burial of the dead, and were called Lollards from the Low German *lollen* or *lullen,* meaning to sing in a low tone, from the subdued and plaintive dirges that they were in the practice of singing while accompanying dead bodies to the grave. According to another opinion the name was first bestowed upon the followers of one Walter Lollard, who preached peculiar doctrines both in England and on the Continent between 1315 and 1322, till in the latter year he was burned as a heretic. Whatever may have been the origin of the name, it became well known in England about the end of the 14th century, when it was applied to the followers of Wyclif. See Lollardism.

Lolos, lō'lōz, an aboriginal fair-complexioned people of China, inhabiting the Ta-liang-shan mountainous country, lying between the Yangtse River on the east and the Kien ch'ang valley on the southwest in Sze-chuen, and also found scattered on the Burmese and Tibetan frontiers. They are divided into tribes governed by hereditary chieftains, and maintain an independent position, frequently warring on their peaceable Chinese neighbors, and making slaves of them. They are descendants of aborigines who were driven southward by the immigration and increase of the Chinese.

Lomami, lō-mä'mē, Kongo Free State, a navigable river of Central Africa which rises near Kazaidi (Msoa), and after flowing almost parallel with the upper course of the Kongo River, enters the latter at Isangui several miles below Stanley Falls.

Lom'ax, Lindsay Lunsford, American soldier: b. Newport, R. I., 4 Nov. 1835. He was graduated from the United States Military Academy in 1856, entered the 2d cavalry, but later resigned from the United States army, became a captain in the Virginia State troops, and 29 April 1861 was made captain in the army of the Confederate States and assistant adjutant-general to General J. E. Johnston. In February 1863 he was appointed colonel of the 11th Virginia cavalry, in July 1863 brigadier-general, and in August 1864 major-general. He commanded a brigade under Fitzhugh Lee, a division under Early, and 1865 was made commander of the valley district. He took part in all the battles in which his portion of the Army of Northern Virginia fought, and surrendered with Johnston at Greensboro, N. C. After the War he was employed in the war records office at Washington, D. C.

Lombard, lŏm'bȧrd, **Peter,** also known under his Latinized name, PETRUS LOMBARDUS, Italian theologian: b. Lugelogno, near Novara, Lombardy, about 1100; d. Paris 20 July 1164. He was a scholar of Abelard, and traditionally the first doctor of the University of Paris. He then became a teacher of theology, and in 1159, bishop of Paris. In his ‹Sententiarum Libri Quatuor,› which became the subject of almost countless commentaries, and until the Reformation had almost classical authority among theologians, he placed the opinions of the Fathers, particularly Augustine, in regard to doctrines under certain titles, and then stated the objections made to them and the answers given by church authorities, but without offering any judgment of his own. The name of his work has given him the surname of Master of Sentences. Consult ‹Life› by Protois (1881).

Lombard Architecture. See ARCHITECTURE.

Lombard College, a coeducational institution founded, in 1851, in Galesburg, Ill., under the auspices of the Universalists. In 1903 there were connected with the school 24 instructors and 204 students. The library contains about 8,000 volumes. It has a preparatory department and a classical department. The degree A. B. is conferred on those completing the classical course.

Lombard Street, a short street in London, which received its name from having been the residence of the Lombards, the money-lenders of former times, whose usurious transactions caused their expulsion from the kingdom in the reign of Elizabeth. It is now chiefly occupied by bankers, and is a place of much importance in the London commercial world. It is the English equivalent of Wall Street.

Lom'bards, Longobardi, or **Langobardi,** a Germanic or Teutonic people who at the beginning of the Christian era were dwelling on the lower Elbe. They make little appearance in history till the 6th century, when, under their king Alboin, they entered Italy in April 568, and, with the help of Saxons and others, conquered the northern portion, which hence received the name of Lombardy. From 713 to 744 the Lombards had a powerful king in the person of Liutprant, who extended his sway, at least temporarily, over the whole of Italy. From that time the power of the Lombards gradually declined, and finally Charlemagne captured Pavia after a six months' siege, and put an end to the Lombard kingdom (773 or 774), the last monarch being Desiderius.

Lombardy, lŏm'bȧr-dĭ, Italy, an ancient kingdom, now a northern compartimento embracing the eight provinces of Bergamo, Brescia, Como, Cremona, Mantua, Milan, Pavia, and Sondrio, with an aggregate area of 9,297 square miles and a population in 1901 of 4,282,728, or 460.66 to the square mile. It comprises that portion of Upper Italy which took its name from the Longobardi or Lombards. (See LOMBARDS.) After the fall of the Lombard kingdom this territory remained attached to the empire of Charlemagne and his successors till 843, when an independent kingdom of Italy arose, out of which in process of time a number of independent duchies and marquisates (Friuli, Mantua, Susa, etc.) or republics (Venice, Genoa, Milan, etc.) were formed. When Austria acquired the duchies of Mantua and Milan these provinces were called Austrian Lombardy, a name which they retained till Napoleon formed in 1797 out of them and other districts the Cisalpine, afterward the Italian Republic, and at last, in 1805, the kingdom of Italy. By the Peace of Paris, 1814, and the act of the Congress of Vienna, 1815, Austria received back its old Lombard possessions; but in consequence of the war of 1859 was compelled to cede them to Victor Emmanuel, king of Sardinia, by the Peace of Zürich, and in the following year they became part of the kingdom of Italy.

Lombok', East Indian Archipelago, one of the Lesser Sunda islands, east of Java, between Bali on the west and Sumbawa on the east. Area 3,136 square miles. The island is mountainous and of volcanic origin. Between the two ranges which traverse the island, one of them rising to the height of 11,800 feet, there is a plain fertile in rice, cotton, maize, coffee, and tobacco. The upper and former ruling class are Brahmans, and the mass of the people, Mohammedans. The capital, Mataram on the west coast, was bombarded in 1894 by a Dutch expedition, since when the island is administered by a Dutch resident. Pop. 370,000.

Lombroso, Cesare, chä'zä-rĕ lōm-brō'zō, Italian scientist: b. Verona 1836. In 1862 he became professor of psychiatry at Pavia, and later of medical jurisprudence and psychiatry at Turin. He became widely known through his investigations of the abnormal human being, and through his theories deduced therefrom; theories which encountered great opposition and are not yet entirely accepted, but which formed in part the basis for the present criminal anthropology. He published numerous works, such as: ‹The Criminal› (1887–95); ‹The Man of Genius› (1890; Eng. trans. 1891); ‹The Anarchists› (1895); ‹The Causes of, and Contest against, Crime› (1902). Consult the study by Kurella (1892).

Lomond, Loch, lŏH lō-mŏnd, Scotland, a beautiful lake in the counties of Stirling and Dumbarton. Its length is about 24 miles; the breadth at the lower or southern end, 7 miles, at the upper end less than half a mile. For 14 miles from the head the breadth does not exceed 1½ miles. The lake is almost entirely surrounded with ranges of hills; and its surface is studded with numerous islands. The principal hills are on the eastern side, where a branch of the Grampians culminates in Ben Lomond, 3,192 feet high, on the very border of the lake. Through the glens intersecting the surrounding hills, the drainage of the district flows into the lake by the Falloch, Endrick, Fruin, Luss, and other streams; and the river Leven at the southwestern extremity conveys the overflow to the Clyde. The greatest depth is in the narrower part of the lake, where in some parts it reaches 600 feet. Fish, including salmon, salmon-trout, pike, perch, eels, and powans, usually called fresh-water herrings, are abundant. Steamboats in connection with the North British and the Caledonian Railway ply on the loch.

Lon'don, Jack, American author: b. San Francisco, Cal., 12 Jan. 1876. He was educated at the University of California which he left to go to the Klondike region, and in 1892 went to sea before the mast. He has tramped throughout Canada and the United States for sociological study, and spent some time in seal fishing in 1893. He has published: 'The Son of the Wolf: Tales of the Far North' (1900); 'The God of his Fathers' (1901); 'A Daughter of the Snows'; 'The Children of the Frost'; 'The Cruise of the Dazzler' (1902); 'The War of the Classes' (1904).

London, England, the largest city in the world, the metropolis of the United Kingdom of Great Britain and Ireland, and of the British Empire, situated on both banks of the Thames River, about 40 miles from its mouth, the latitude and longitude of Saint Paul's Cathedral being respectively 51° 30′ 48″ N. and 0° 5′ 48″ W. Modern London consists of the conglomeration of former towns and villages in the counties of Middlesex, Surrey, and Kent, which, as encircling suburbs of the ancient cities and liberties of London and Westminster, in the course of time, chiefly during the 19th century, have become practically absorbed with them in a common urban aggregation, by the addition of miles of connecting streets of dwelling houses and other buildings. In 1855 a Metropolis Local Management Act was passed, defining for sanitary purposes, outside the nucleate city of London with 673 acres, 186 parishes covering an area of 74,839 acres, 31,562 acres being in the county of Middlesex, 23,123 acres in Surrey, and 20,064 acres in Kent. By the Local Government Act of 1888, this area was constituted the metropolitan county of London, and for administrative purposes was divided into 28 boroughs, including the city of Westminster, but excluding the city of London. Several of these boroughs are described under their respective headings.

Table of the metropolitan boroughs, with their size in acres and population in 1891 and 1901:

BOROUGHS.	Area acres	Pop. 1891	Pop. 1901
North of the Thames.			
City of London..........	673	37,702	26,923
City of Westminster......	2,502	201,969	183,011
Bethnal Green	759	128,929	129,680
Chelsea	660	72,954	73,842
Finsbury	589	109,981	101,463
Fulham	1,703	91,790	137,289
Hackney	3,289	100,606	219,272
Hammersmith	2,286	97,283	112,239
Hampstead	2,265	68,126	81,942
Holborn	405	66,781	59,405
Islington	3,091	319,155	334,991
Kensington	2,291	170,071	176,628
Paddington	1,356	135,955	143,976
Poplar	2,328	166,880	168,822
St. Marylebone	1,473	144,083	133,301
St. Pancras	2,694	234,749	235,317
Shoreditch	658	124,727	118,637
Stepney	1,765	285,116	298,600
Stoke Newington	863	47,988	51,247
South of the Thames.			
Battersea	2,160	150,166	168,907
Bermondsey	1,499	136,014	130,760
Camberwell	4,480	233,706	259,339
Deptford	1,563	101,770	110,398
Greenwich	3,852	78,493	95,770
Lambeth	4,080	278,393	301,895
Lewisham	7,014	88,933	127,495
Southwark	1,131	202,479	206,180
Wandsworth	9,130	155,524	232,034
Woolwich................	8,277	98,994	117,178
Total...................	75,512	4,228,317	4,536,063

The term London is therefore legally and properly applicable to the entire area within the county boundaries. But outside the county limits, the urban aggregation extends with numerous large and connected towns, to 15 miles around Charing Cross. These are embraced in the boundaries of the metropolitan and city police districts and constitute Greater London, bringing the total area to 443,421 acres with a population (1891) 5,633,806, (1901) 6,580,615.

Climate.—London is one of the healthiest of the large cities of Europe. The average annual rate of mortality per 1,000 in 1840–50 was 26.6; 1850–60, 24.4; 1860–80, 23.2. The death rate for the year 1901–2 was 17.6, little above that of all England. The mean annual temperature is about 50°, and the general range of the thermometer is from 20° to 81°; the highest and lowest markings being, for the most part, in August and January respectively. The prevailing wind is the southwest, and there are few places in the kingdom where less rain falls. In the beginning of winter London is occasionally enveloped in fogs, which are especially dense in the lower parts, and greatly aggravated by the perpetual pall of smoke-laden air, overhanging the metropolis. This pall, estimated to weigh 7,000,000 tons, is occasioned by the general domestic and industrial use of bituminous coal. Even when this smoke-cloud does not take the unpleasant form of fogs it keeps the sunshine away to quite a considerable extent, in winter robbing London of fully half the sunshine it ought to enjoy, and giving to the metropolis that general gloom and begrimed aspect of buildings which is so depressing to visitors.

General Aspect, River, Bridges, Main Thoroughfares, etc.—London stands on alluvial deposits consisting of beds of clay and gravel, below which is the hard clay stratum known to geologists by the name of the "London clay," in the middle of the great chalk basin extending from Berkshire to the east coast. On the north bank of the Thames where the principal part of London stands, the site rises gradually at the rate of 36 feet per mile, while on the opposite bank the houses cover a nearly uniform and extensive flat, lying in some places several feet below the highest tides. Within the limits of London the Thames varies considerably in width. At Putney it is 550 feet, at Battersea 960, at Vauxhall 630, at Westminster 275 feet, at Waterloo 1,140 feet, while at Blackfriars it narrows down to 830 feet. At London Bridge it is 800 feet wide, and at Woolwich 1,470 feet wide. The bridge farthest down the river is Tower Bridge, just below the Tower of London — a bascule bridge which allows the passage of large vessels. London Bridge connects the city at King William Street with Southwark at the junction of Wellington Street and Tooley Street. About 500 yards further up the river stands Southwark Bridge, connecting the city and Southwark. About half a mile further west Blackfriars Bridge connects the city at Bridge Street with Southwark at Great Surrey Street. Waterloo Bridge, nearly half a mile above the former, including its approaches, supported on semicircular arches, is 2,456 feet long; it is perfectly level, and connects the Strand with the

Waterloo road. Westminster Bridge crosses the river at the north end of the Houses of Parliament from Westminster to Lambeth. Further up the river Westminster and Lambeth are again connected by Lambeth and Vauxhall Bridges. The Chelsea Suspension Bridge connects Chelsea and Pimlico on the north side with the Battersea Park on the south. The Albert Bridge connects the Chelsea Embankment with Battersea to the west of Battersea Park; and the Battersea Bridge unites Chelsea and Battersea a little further west. Putney Bridge, a magnificent structure of granite, connects Fulham and Putney; and Hammersmith Bridge, the last in London, connects Hammersmith with Barnes. There are also six railway bridges across the Thames. One of them, at Charing Cross, displaced the old Hungerford Suspension Bridge, but is provided with a footway on one side, so that the original communication is preserved. Another bridge, belonging to the same line of railway, crossing the river from Cannon Street, City, is similarly provided. The two railway bridges at Pimlico, which look like one, belong to the London, Brighton, and South Coast Railway Company, and the London, Chatham, and Dover. The latter company owns a bridge close to Blackfriars Bridge. New bridges are building at Vauxhall and Kew, while that designed to be built at Lambeth is said to be as notable a combination of art and utility as the famous Alexander III. bridge in Paris. The once famous Thames tunnel, 2 miles below London Bridge, opened in 1843 as a roadway under the river, now serves as a railway tunnel. A subway under the river, lined with iron hoops, connects Tower Hill and Tooley Street, Southwark; and there is a great tunnel for foot-passengers and vehicles between Blackwall and East Greenwich. An underground electric railway to South London passes under the river at London Bridge. Besides these there are steamboat ferries between Greenwich and the Isle of Dogs, and between North and South Woolwich.

Since the passing of the Metropolis Management Act of 1855 great changes have been made in the condition of London. The gigantic operations connected with the sewerage of London and the embankment of the Thames, from Blackfriars to Chelsea on the north side, and from Westminster Bridge to Lambeth on the south, have produced great changes, while important lines of streets have opened up districts formerly almost inaccessible. These operations have also absorbed the former little rivers and rills, leaving only a corner, an alley, or a street, for example, Fleet Street, with their name for a monument. Further extensive main drainage works are being carried on which are estimated to cost $15,000,000, and extensive street improvements sanctioned by Parliament, are in progress, among which the most important is the street from Holborn to the Strand through the Soho district and the widening of the Strand. In all the districts of London, and particularly in the City and West End, there has latterly been great improvement in the quality of architectural decoration and in public buildings, and stone has to a considerable extent replaced brick and plaster, though not so far as to change the aspect of some localities. Though some of the leading streets are wide, others are narrow and irregular. The decorative character of the streets about Lombard Street and the Mansion House in the City has been fostered by the growth of numerous banking and insurance companies, while the new office and store buildings in various quarters, especially the one opposite St. Mary le Strand, the hotels and apartment houses on the American steel structure plan, added an entirely new style of brick architecture.

«The City» — the historic centre of London — is bounded south by the Thames; it extends north to Charterhouse Square, east to Middlesex Street, and west to the New Law Courts. Till 1878 this last boundary was marked by Temple Bar, an old gateway crossing Fleet Street near the Temple; but in that year this structure was removed, and a memorial was erected on the site. The portion of the City inside the area of the former mediæval walls is known as «London within the walls»; and all the wards are bounded by the site of the old walls; the portion outside extends irregularly all around, and is known as «London without the walls.»

Of the streets that run through Modern London the most important from west to east is that which enters from Kew into Hammersmith, and passing through Kensington, forms the finest of all the approaches to London. It stretches on through Brompton, Knightsbridge and Piccadilly, past fashionable Belgravia, with Kensington Gardens, Hyde Park and Paddington on the north, and with Apsley House and numerous other palatial edifices facing the Green Park, which constitutes its south boundary for about half the length of Piccadilly. This line is broken at the east end of Piccadilly, but passes by Regent Street (or by the Haymarket) and Trafalgar Square into the Strand, which continues it farther east and much nearer the river, and it stretches on past the Temple, along Fleet Street, Ludgate Hill, St. Paul's Churchyard, where it runs into Cannon Street, leading to the Tower on one side, and on the other into Cheapside, Poultry, Lombard Street, Fenchurch Street, Aldgate, and by Whitechapel road, and Mile-end road through the congested poorer districts to the county boundary at Bow. The next great artery between the west and east extends along the Uxbridge road from Acton, entering the county boundary at Shepherd's Bush and passing through Notting Hill, along Oxford Street, through Holborn and Newgate Street, where it joins the more south line above described, at the west end of Cheapside. Farther north is a third line, extending from near Kensington Gardens, through Oxford and Cambridge Terrace along the Marylebone and Euston road to Islington, and thence by the Pentonville and City road to Finsbury Square. Among the leading thoroughfares running north and south the extreme west is Edgeware road, which enters the county at Kilburn, terminating at its south extremity in Oxford Street, from which it runs northwest, but communicating through Park lane with Piccadilly, a little to the west of which, from Hyde Park Corner Place, Grosvenor Place leads down to Buckingham Palace road, from which Vauxhall road forms a connecting line with the river. Park lane and Grosvenor Place on this line contain many of the most select residences of the aristocracy. East of Edgeware road Regent Street

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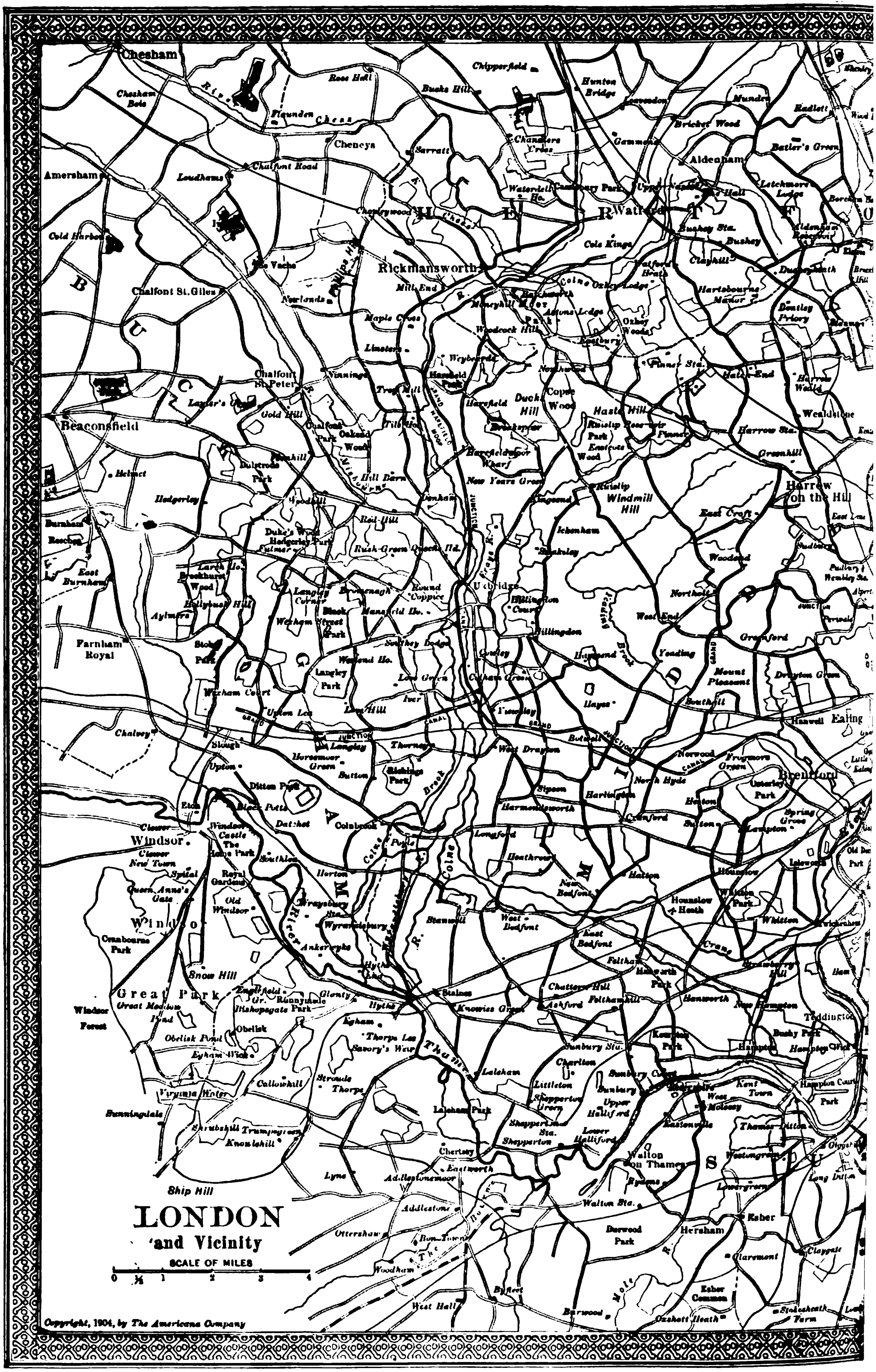

LONDON

'and Vicinity

SCALE OF MILES

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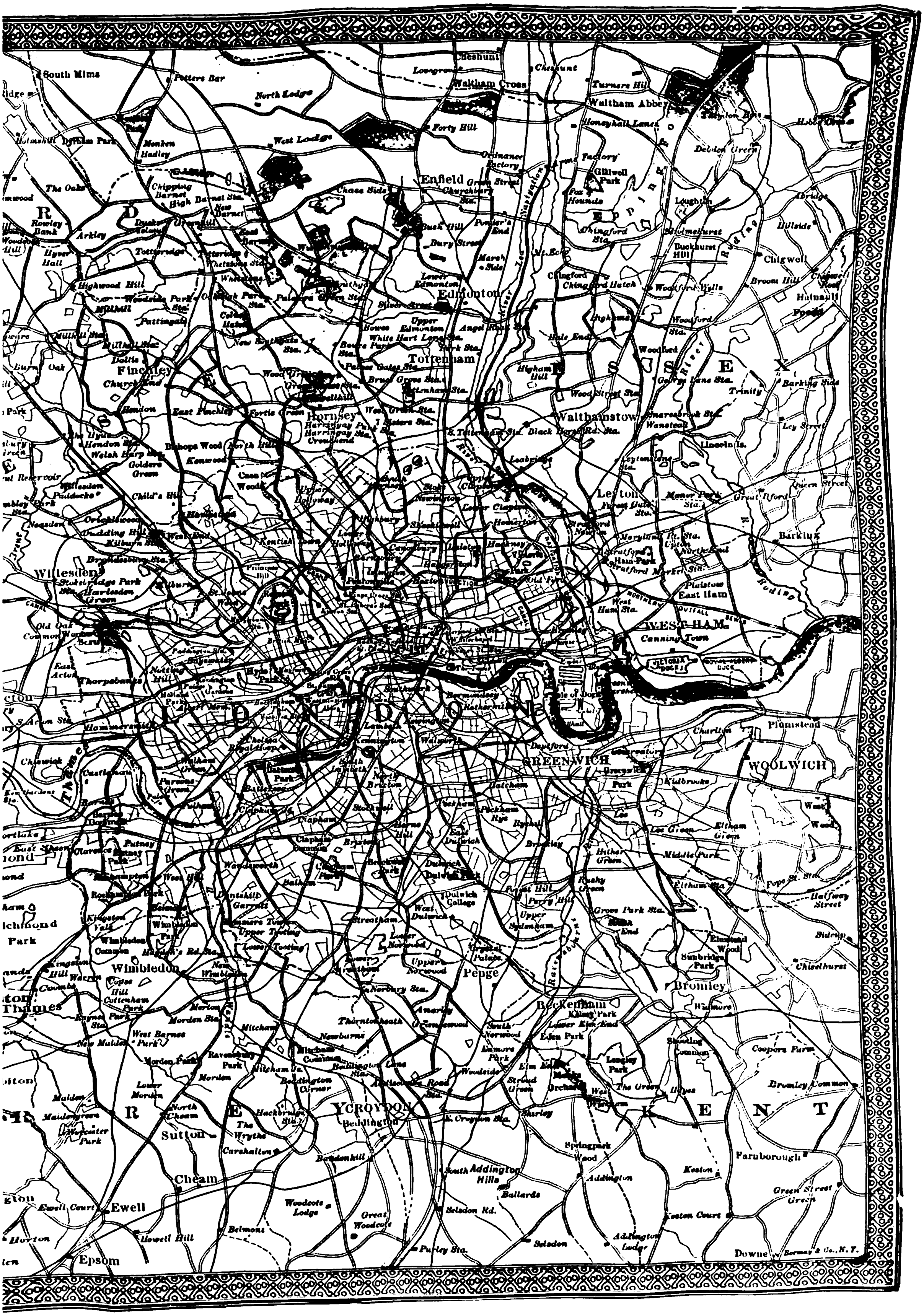
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Edmonton
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Finchley
Hendon
Chipping Barnet
Willesden
Walthamstow
Leyton
Woodford
Chigwell
Loughton
Barking
East Ham
WEST HAM
Canning Town
Victoria Dock
Isle of Dogs
GREENWICH
WOOLWICH
Plumstead
Charlton
Deptford
Lee
Eltham
Bromley
Chiselhurst
Beckenham
Penge
Sydenham
Dulwich
Brixton
Clapham
Battersea
Wandsworth
Putney
Hammersmith
Chiswick
Wimbledon
Kingston
Richmond Park
Mitcham
Morden
Sutton
Cheam
Ewell
Epsom
Carshalton
CROYDON
Beddington
Addington
Farnborough
Keston
Downe
Bormay & Co., N.Y.

with Portland Place, Tottenham Court road with St. Martin's lane, and other connecting lines leading to Westminster, Pimlico and Chelsea, Gray's Inn road, and the line of Chancery lane, Farringdon Street, etc., leading to Fleet Street and Blackfriars Bridge, form some of the most important communications in this direction. Piccadilly and Pall Mall, running east and west, Bond Street, Regent Street, and St. James' Street, north and south, are among the most fashionable streets in the West End, each with its own distinctive character. Bond Street contains the shops most patronized by the aristocracy. Regent Street, according to some tastes the handsomest street in London, is the fashionable promenade and has some of the finest shops. It unites by Portland Place in the north with Regent's Park, and Primrose Hill Park, and intersects Oxford Street and Piccadilly, and reaches south to Waterloo Place, by which it communicates with St. James' Park. The greatest and most picturesque thoroughfare in London, not of an exclusively mercantile character, is the line of the Strand and Fleet Street. In the east there are the great roads leading through Mile End to the Docks, and south of the Thames great roadways lead from the centre into Kent and Surrey.

The Thames Embankment is one of the modern features of London. The Victoria Embankment on the north side consists of a wide roadway, with a granite retaining wall, surmounted by a parapet broken by pedestals for lamps. There are well contrived landing-stages and recesses, these features of the Embankment being rendered highly ornamental by balustrades, pedestals for sculpture, etc. From the Temple to Charing Cross portions of land reclaimed from the Thames have been laid out in public gardens. The Chelsea Embankment extends from the Albert Suspension Bridge along Cheyne Walk to Chelsea Hospital. From the fine building of St. Thomas' Hospital next Westminster Bridge, on the south side of the river, extends the Albert Embankment, continuous with the old quay at Lambeth. A very valuable improvement in the City was the Holborn Valley Viaduct, extending from Newgate Street to the end of Hatton Garden. Broad roads also lead to the Central Meat Market, and to the lower level of Farrington Street, which is crossed by the viaduct obliquely, with three Gothic arches supported on 12 hexagonal columns of polished red granite. The streets of London are regularly kept clean, and are well lighted and paved. Wood and asphalt pavements are gradually displacing stone in the more crowded thoroughfares. The estimated length of streets in London is over 2,000 miles.

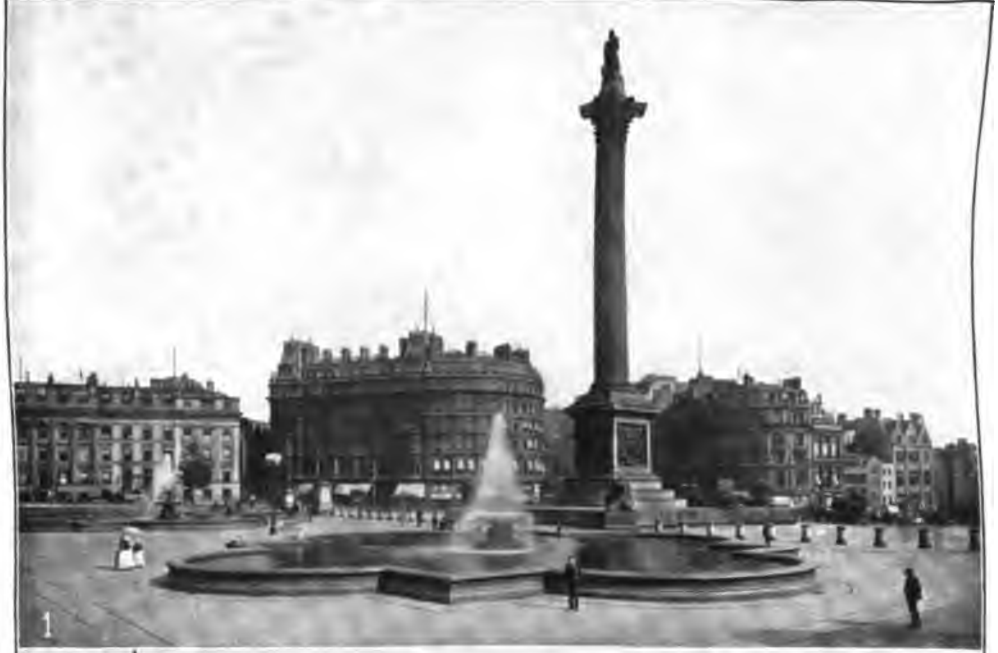
Public Buildings in the City.— A number of the most important buildings are situated within the ancient city. The nucleus of the whole is formed by the Bank of England, the Royal Exchange, and the Mansion House, which all face toward an open area; the centre of bustle and business, near the middle of the city, adorned with the handsome offices of several assurance companies. The Bank of England, in Threadneedle Street, was built in 1732, and now forms a low flat, insulated, irregular parallelogram covering four acres of ground. The Royal Exchange is an extensive and ornate building, having a portico surmounted by a pediment enriched by sculpture. It surrounds an open interior quadrangle, in the centre of which is a marble statue of Queen Victoria. In this court, which is surrounded by covered arcades, the meetings of the merchants on 'Change are held. An equestrian statue by Chantrey of the Duke of Wellington occupies the area in front of the building. The Royal Exchange, originally founded by Sir Thomas Gresham in 1567, was burned down in 1666, rebuilt, and again burned down in 1838, the present edifice being erected on its site. The exchanges for special purposes are: The Stock Exchange in Capel Court; the Coal Exchange, Lower Thames Street, a sumptuous though rather incongruous building, the great hall of which is circular, 60 feet in diameter, and 74 feet to the apex of the glazed dome; the Corn Exchange, in Mark Lane, opened in 1747, enlarged and partly rebuilt in 1827 and now again almost entirely rebuilt. The Mansion House, the official residence of the lord-mayor, was built in 1739-53. The Guildhall, at the north end of King Street, Cheapside, is where the principal business of the corporation of the city of London is conducted. The civic banquets are given here. A splendid new council chamber was completed in 1885. The hall itself is now covered with a decorative open timber roof of the Perpendicular Gothic style; the old front has been replaced by a new Gothic front. The hall is capable of seating 3,000 persons, and contains some monuments of ordinary sculpture; and at the west end, raised on pedestals, are colossal figures of Gog and Magog. In 1872 a handsome suite of rooms was added to the Guildhall for the Corporation Library and Museum. The library consists of upward of 40,000 volumes. Of late years some of the city companies have remodeled or rebuilt their halls. Of these the Clothworkers' Company have produced the most elaborate street façade, but its confined situation in Mincing lane does not permit it to be seen to advantage. The Goldsmiths' Hall, behind the post-office; the Fishmongers' Hall near London Bridge; and the Ironmongers' Hall, in Fenchurch Street, are the principal structures. In the city many old and familiar landmarks have been removed. The once famous East India House in Leadenhall Street, and the Excise Office in Broad Street, have been replaced by immense piles of offices; Doctor's Commons has been cleared away for the new street to the Mansion House; Sir C. Wren's College of Physicians is supplanted by meaner buildings; the site of the Steel-yard, memorable in the history of old London, is absorbed by the city terminus of the South Eastern railway; old churches have been leveled, and old inns, hostelries and streets, replete with great historic and literary associations have disappeared; while outside the city a whole region full of good and bad memories has been cleared away for the new Law Courts; the Statepaper Office is displaced by the Foreign Office; Tattersall's is crossed by streets; chambers occupy the ground of the Old Thatched House; and a gymnasium has supplanted the British Institution.

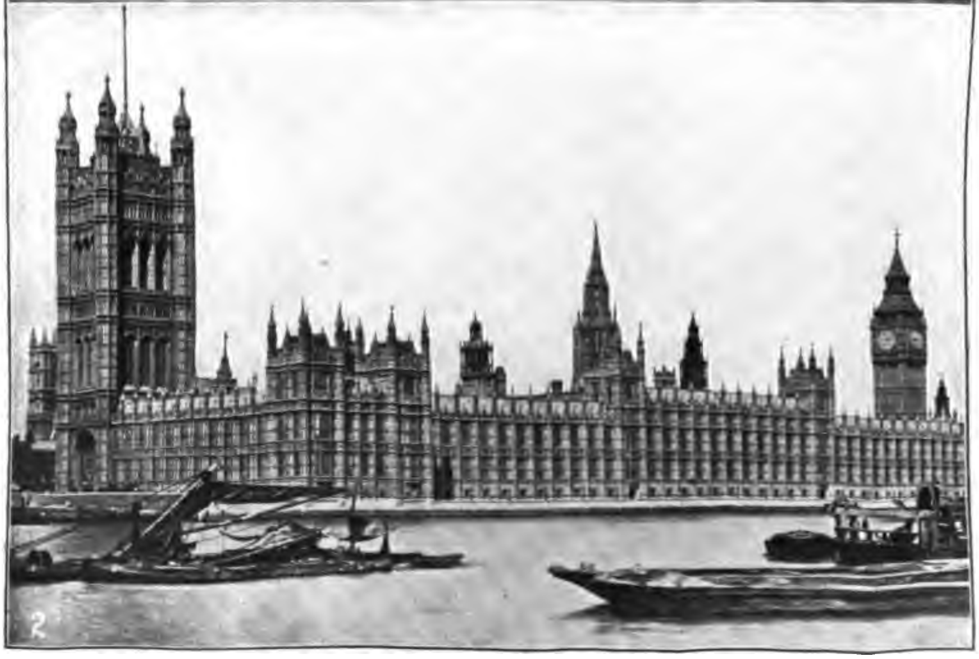
The Tower.— This celebrated fortress, which formed the dominating feature of Norman London, stands on the north bank of the Thames, y adjoining the boundary of the city. use as a fortress the Tower was the residence of several kings and queens l, but is now only used as a storage and as the headquarters for certain iatters. It occupies an area of 12 osed within a wall surrounded by a dry, and laid out as a garden. On ide is an archway called the "Traitors' ·ough which state prisoners were om the river. The whole region of abounds with reminiscences of Engy, conjured up by such names as lgernon Sydney, Anne Boleyn, Cath·ard, etc. The most ancient part is ow known as the White Tower, which d about 1078 for William the Con- Gundulph, bishop of Rochester. It · the centre of the quadrangle, around placed several other towers, each distinctive name. The Tower con- Wellington Barracks, erected on the : grand storehouse burned down in ewel room, a modern edifice, in which ·ed the regalia of Great Britain; the ory, Queen Elizabeth's armory, and ı of St. Peter-ad-Vincula.

Buildings.— St. Paul's Cathedral :he summit of Ludgate Hill, on a site formerly used for pagan worship, :en occupied by a church from early ies. Old St. Paul's, a vast Gothic ·as destroyed by the great fire of 1666, ı few columns of the chapter house n to view. The present church, on ite, the greatest and most conspicuous al ornament of London, planned and : by Sir Christopher Wren, was be- '5, and completed in 1710. It is 510 gth from east to west, while the tran- feet long, exclusive of the semicircu- at each end; the breadth of the west) feet, and the height of the walls 110 building is crowned with an immense nounted by a lantern with ball and height of the latter being 404 feet round. It is built of Portland stone, 747,954, which was paid by levying a l. The interior has been decorated at by voluntary means, according to the :entions of Wren. Among the monu- ontains are those of Wellington, Nel- Ralph Abercromby, Sir John Moore, on, Howard, Sir Joshua Reynolds, ıt men of more modern times. Near nder the centre of the dome, lie in- d Nelson and the Duke of Welling- minster Abbey, one of the finest of the Pointed style in Great Britain, the reign of Henry III. and Edward was erected on the site of the Saxon ınded by Sebert. The beautiful chapel end was added by Henry VII., and inning of the 18th century the upper ıe two towers at the west end were ·m designs of Sir Christopher Wren. :et long, and 195 feet wide within the re kings and queens have been rom Edward the Confessor to Edward here many of them are buried, some others without monuments. In the ısept are the tombs and honorary monuments of great poets, from Chaucer down to Tennyson, whence it is called "Poet's Corner"; and in other parts are numerous sculptured monuments to statesmen, warriors, philosophers, divines, patriots, and eminent individuals generally, many of whom are interred within its walls. Of the other sacred edifices in London the most remarkable are: St. Bartholemew's in West Smithfield, which consists of the chancel and lady-chapel only of the original church, and contains some beautiful specimens of Norman, Early English, and lat styles of architecture; St. Saviour's in Sout wark, which boasts of the best Early Engli architecture in London in its choir and lad chapel, the only portions of the old church wh remain; St. Giles, Cripplegate, a beautiful Reformation church; St. Stephen's, Walb the interior of which is extremely fine, and erally regarded as one of Wren's best wo and the Temple Church, which is one of very few round churches now remaining in E land, and combines transition Norman ar tecture with Early English, the latter in choir, which was founded in 1240. Besides t there are very few of the older churches among the most interesting of which is Church. Of the remainder, Wren's ch are very beautiful, and perhaps St. Bri Fleet Street, and St. Martin's-in-the-Fiel be specified. During the Georgian perio ous specimens of architecture were erecte these still predominate. Among Roman lic churches in London are St. George's dral, in Southwark, finished in 1848, an magnificent new cathedral of Byzantine tecture at Westminster, with an imposing panile 300 feet high. The largest arch ov known church doorway admits 10,000 wo ers to ample accommodation under a dome 120 feet high. The plan dispense stained glass windows — a wise arrange dark London. Twenty-nine marble co support aisles, galleries, and arches of tra with bases of Norwegian granite and capi white Carrara elaborately carved. Many Nonconformist churches are handsome tures. Among the finest of them are th Temple on the Viaduct, opened in 1874; church in Westminster Bridge road; the tolic (or Irvingite) church in Gordon S and the Tabernacle, Newington Butts; the site of the former Royal Aquarium at minster is to be occupied by a mammoth con tional building, built by the Wesleyan Me dists.

The Houses of Parliament.— These co of the House of Peers and the House of C mons, with the connected apartments and o the whole practically forming one structure is a highly-decorated structure in the T Gothic style, after designs by Sir Charles B It stands on the left bank of the Thames, tween the river and Westminster Abbey, and tends over an area of about 8 acres. The faça which overlooks the river is 900 feet in length. The walls are of brick, faced externally with magnesian limestone, and the whole edifice is separated from the river by a terrace of Aber deen granite. It is paneled with rich tracery and profusely decorated with statues and shiel of arms of the kings and queens of Engla

LONDON.





1. Trafalgar Square. 2. Houses of Parliament.

from the Conquest to the present time. In the southwest angle is the Victoria Tower, supported on four pointed arches 60 feet in height; it is 75 feet square and 340 feet in height. There is also a tower in the centre, 300 feet high by 60 feet, surmounted by a lantern; and the clock tower, at the north end of the edifice, with its richly decorated spire, rises 320 feet. The House of Peers is an apartment 97 feet long, 45 feet wide, and 45 feet high; magnificently decorated throughout with carved oak paneling, a profusion of gilding, paintings in fresco, and richly stained glass windows. The House of Commons is a somewhat smaller apartment, fitted up in a much plainer style. Paintings in fresco and the water-glass medium, and statues of great statesmen have been added to the internal decorations; and a statue of the architect has been placed on the staircase leading up to the committee rooms. Westminster Hall, the most magnificent hall in the kingdom, 290 feet long, was built by William Rufus and improved by Richard II. It has recently been exposed on the west side, the ground laid out as an ornamental garden, and a fine statue of Cromwell erected therein. The hall is now not used except as a member's entrance to the House of Commons. In Old Palace Yard is an equestrian statue of Richard Cœur de Lion by Baron Marochetti, and a statue of Canning.

Palaces.— St. James', erected by Henry VIII. from a design by Holbein, at the foot of St. James' street, is an irregular and picturesque brick building. It is well adapted internally for royal levees and drawing rooms, which are held here during the fashionable season. Buckingham Palace, facing the west end of St. James' Park, was built by George IV., and consists, since the erection of the east front, of a quadrangular range of buildings. In the gallery, which is 160 feet long, are some good pictures. The king resides here occasionally in the spring and summer. Whitehall — the Banqueting House — designed by Inigo Jones in the Palladian style, is the only remnant of the ancient palace of Whitehall; the ceiling, painted by Rubens, is the most extensive work of that artist existing in the country. Kensington Palace, situated in Kensington Gardens, is a brick building of the Jacobean period, and was thrown open to the public by Queen Victoria shortly before her death. It was the birthplace of Her Majesty. Lambeth Palace, on the Surrey side of the river, opposite the Houses of Parliament, has been for many centuries the residence of the archbishops of Canterbury. It is a brick edifice, and comprises a great variety of styles in architecture, from Early English downward, and contains a library of 30,000 volumes. Fulham Palace, the residence of the bishops of London, is a building of no architectural pretension. It is pleasantly situated on the Thames, and at one time had extensive and well-timbered grounds. Greenwich Palace, once the home of the Tudor and Stuart sovereigns, is a stone building of considerable beauty, now used as a training school for the navy.

Government Offices.— These are mostly situated in and near Whitehall. The Treasury, Home Office, and Education Department occupy one range of buildings, which have been improved by a uniform and handsome façade. The India Office and the Local Government Board faces St. James' Park. The Horse Guards, which are somewhat nearer Charing Cross, have little to admire in their external appearance, but opposite, and next to the Banquet Hall of the old Whitehall Palace, from the window of which Charles I. stepped to his execution, rises the New War office, and farther on the New Admiralty office. An extensive pile of government offices, for the Foreign Office and the Colonial Offices, has been erected in Downing Street. The style is Italian and the building exhibits a large amount of decorative detail, part of it in red and other colored marbles and granites. Some of the public offices are in Somerset House, once a royal palace of Charles II. It has a spacious and handsome quadrangle, finished in 1782, from designs by Sir W. Chambers: its north façade, 200 feet in length, faces the Strand; and its south front, 800 feet long, overlooks the river. The Post-office, near St. Paul's, is a spacious and handsome building. It is 390 feet long, 130 feet wide, and 64 feet high. Its façade, which is toward St. Martin's-le-Grand, has three Ionic porticoes. A supplemental building for telegraph and other business occupies the opposite side of St. Martin's-le-Grand. The Mint, a stone building of the ordinary Georgian architecture, finished in 1810, stands on Tower Hill, and occupies about 10,000 square yards. The royal arsenal and dockyard for military stores is at Woolwich.

Courts of Law.— London is the seat of the supreme courts of the kingdom. Several of these were long accommodated at Westminster Hall, but in 1883 were removed to the New Law Courts at the junction of the Strand and Fleet Street. This great building occupies an area of nearly four acres. It is of a somewhat heavy mediæval character, a large western tower being its chief feature. The Old Bailey, adjoining the famous Newgate Prison, has, with the latter, been demolished to make way for the palatial Sessions House of the City of London. It is the central criminal court for the trial of prisoners who have committed serious offenses in the metropolitan district. One or more of the judges of the law courts sit here also in the old court, while the new court is presided over by the recorder and common sergeant of the City of London. There are numerous county courts within London for the trial of small debt cases. Besides the above there are also the Clerkenwell Session house; the city police courts, which are held at the Mansion House and Guildhall, and are presided over by the lord-mayor and one of the aldermen; and numerous police courts, each of which is presided over by a barrister of at least seven years' standing. The Inns of Court as they are called are four, the Inner Temple, Middle Temple, Lincoln's Inn, and Gray's Inn. Every law student, before he can be called to the bar, has to be entered as a member of one of these inns, and to dine a certain number of times in the common hall. The Inner and Middle Temple are close to Temple Bar, between Fleet Street and the river. The roof of Middle Temple Hall, built in 1572, is considered the best specimen of Elizabethan architecture in London. Lincoln's Inn is situated between Chancery Lane and the extensive square called Lincoln's Inn Fields, now open as a public garden. A handsome hall and library in the Tudor style, from the designs of Hardwick, have been erected in the gardens. Gray's Inn stands on the north side of Holborn. The gardens, first planted about 1600, were a fashionable promenade in the time of Charles II., and for some time after. The other "inns," Staple Inn, Barnard's Inn, Furnival's Inn, Clifford's Inn, New Inn, Sergeant's Inn, are now all in private hands and not connected with the law.

Clubs.— Many of these establishments, having most elaborate and ornate buildings, are among the principal architectural features of West London. They are situated chiefly in and near Pall Mall and vie with each other in elegance and luxury. The principal are: the Athenæum, possessed of a fine library, and having a great many artists and men of science and letters among its members; the Army and Navy, the United Service, the Guards', and the Junior United Service; the Carlton, the great Tory club, standing side by side with the Reform club in Pall Mall, the former numbering 1,800 and the latter 1,400 members; the Junior Carlton; the Oriental; the Travelers'; Brooks', one of the oldest of the clubs; White's, a still older club, much frequented by the Conservative nobility; the Conservative; the Devonshire; the Oxford and Cambridge; the Garrick, frequented by lovers of the drama; and four political clubs, which have the largest numbers of members, the Constitutional having 6,500, the National Liberal 7,000, the Junior Conservative 5,500, and the Junior Constitutional 5,000. Clubs are rapidly extending in London, and many have been established of late years to meet special purposes.

Hotels.— The Grand Hotel, Trafalgar Square, occupying part of the site of old Northumberland House; the Victoria Hotel and Hotel Metropole in Northumberland Avenue; the Hotel Cecil in the Strand; the Savoy Hotel on the Embankment; the Carlton Hotel at the corner of the Haymarket; the Russell Hotel, occupying the greater part of the east side of Russell Square, recently built; and De Keyser's immense hotel at Blackfriars, are the most important and attractive. There are large hotels at Charing Cross and Cannon Street in connection with the South Eastern railway, at St. Pancras in connection with the Midland railway, and at Marylebone in connection with the Great Central railway, the last named being the largest and one of the handsomest in London. Also associated with railways are the Great Western hotel at Paddington; the Great Northern hotel at King's Cross; the Grosvenor hotel at Pimlico. Other large hotels are the Langham hotel, Portland Place; the Westminster Palace hotel in Victoria Street; the Salisbury hotel, in Salisbury Square, Fleet Street; the First Avenue near Gray's Inn; and the famous Ship hotel at Greenwich, where the ministerial whitebait dinner used to be held, while new hotels in London are being erected almost everywhere.

Theatres, Public Halls, etc.— The principal theatres are Covent Garden (the Royal Opera House), opened in 1858; Her Majesty's Theatre, Haymarket, the historic Drury Lane, the Haymarket, the Princess', the Lyceum (now being demolished), the Strand, the Adelphi, the Surrey, the Gaiety (recently demolished), the Globe, the Opera Comique, the Pavilion, the Standard, the Vaudeville, St. James', the Savoy, the Avenue, the Comedy, Criterion, Terry's, the Lyric, the Garrick, the Shaftesbury, the Duke of York, the Prince of Wales', Wyndham's, and the Court. Local theatres have been built in many of the outlying parts of London. St. James' Hall, remarkable almost entirely for its interior, is chiefly devoted to musical entertainments of a high class. The Queen's Hall in Portland Place, and the Albert Hall at Kensington, are devoted to high-class music. Hanover Square Rooms were once famous as concert rooms. Exeter Hall, in the Strand, is occupied by the Young Men's Christian Association, and is used also for the annual May meetings of the different religious societies. The Freemasons' Hall in Great Queen Street, is well known, and Olympia, at West Kensington, is a large and imposing hall in an extensive area. The Congregational Memorial Hall, and the Agricultural Hall, Islington, the largest covered area in London, are also important buildings of this kind. The Empire and the Alhambra in Leicester Square are the chief of numerous music halls in London, where in general the entertainment is not of a very elevated description, though the improvement of late years is marked.

Markets.— These are numerous, but have generally little to attract either in external beauty or in internal arrangement. The principal ones are: Billingsgate for fish; the Borough Market, Southwark, and the famous Covent Garden for vegetables, fruit, flowers, and plants; Leadenhall for poultry, game, etc.; Deptford for foreign cattle; Smithfield for fresh meat, poultry, and fish; the Islington cattle market, in the Caledonian road. The Spitalfields market and the Woolwich market, for vegetable products, are included in the public markets. But London is inadequately provided. The city corporation own all the largest markets, and exercise charter rights to prevent others being erected. The result is that all retail markets are in the hands of costermongers, who line many of the most prominent of the public thoroughfares with their barrows and portable stalls, and who are under no public control as to the produce they sell.

Museums, Galleries, Libraries.— The British Museum (q.v.), founded in 1753, in Great Russell Street, is a spacious and imposing edifice, with a classical façade and sculpture in the pediment, built between 1823 and 1857. It contains an immense collection of books, manuscripts, engravings, drawings, sculptures, coins, minerals, stuffed animals, fossils, preserved plants, etc., and a magnificent collection of ethnographical objects, Egyptian, Assyrian, Etruscan, Greek, and other antiquities. An extensive building (about 650 feet long) has been erected in the South Kensington quarter for the accommodation of the natural history collections. The museum of the Royal College of Surgeons, on the south side of Lincoln's Inn Fields, a rather handsome building, contains a magnificent collection of human skulls from all parts of the world, and many curious surgical preparations. The Soane Museum, on the north side of Lincoln's Inn Fields, possesses many valuable objects, consisting of books, paintings, prints, MSS., drawings, maps, models, plans, etc. The Dulwich College gallery contains many interesting pictures left by Alleyne, the contemporary actor of Shakespeare's age. The great South Kensington or Victoria and Albert Museum contains most valuable collections, carefully arranged for purposes of instruction, in connection with which are the schools and headquarters of the Department of Science and Art. Museums have also been established at Bethnal Green and in South and North London, and quite recently Hertford House, with its priceless art treasures, the gift of Sir Richard Wallace, and the Horniman Museum at Forest Hill, the gift of P. J. Horniman, have been added to the London museums. The chief picture gallery in London is the National Gallery, on the north side of Trafalgar Square. It contains about 1,200 paintings, acquired partly from donations, partly by purchase. The National Portrait Gallery is a collection of over 1,100 portraits, busts, and medallions brought together since 1858. For this collection a new building besides the National Gallery has been provided by private munificence; and the Tate Gallery of British Art, on the Thames Embankment has been similarly acquired. The Royal Albert Hall of Arts and Sciences, a memorial to the late prince consort, is a huge building between the Horticultural Gardens and Kensington road. It was erected for the purposes of science and art, musical performances, exhibitions, etc. It is chiefly used for concerts and is capable of accommodating an audience of 8,000, while the orchestra itself accommodates 1,000 performers. The building also contains a picture gallery. In Hyde Park, immediately opposite this building, is the Albert Memorial. The north wing of Burlington House, Piccadilly, has been granted to the Royal Academy and a suite of rooms built in the rear of it for exhibitions. The east and west wings of Burlington House are occupied by various learned societies, the Royal Society, the Society of Antiquaries, and others. Near the South Kensington Museum and the Albert Hall is the splendid block of buildings of the Imperial Institute, with its various permanent collections and exhibitions, and institutions. Besides the British Museum library, the chief libraries are: Lambeth Palace library, the Guildhall library, Sion College library, the London library (subscription), London Institution library, and in addition large circulating libraries and many free public libraries supported by taxes.

Educational Institutions.—At the head of these stands the London University (q.v.) which promises to become the foremost scientific university in the kingdom. Other institutions are denominational colleges for theology (in some combined with general education); the Royal Naval College, Greenwich; the Royal Military Academy, Woolwich; the Royal College of Science; the medical schools attached to the hospitals; Royal Academy of Music; Royal College of Music; Trinity College, chiefly for music; several colleges for ladies, etc. Among the grammar and secondary schools are: St. Paul's School, founded in 1509, which provides a free education for 153 boys, with scholarships to Oxford and Cambridge; the Merchant Tailors' or Charterhouse School (q.v.); Christ's Hospital (q.v.); Westminster School, founded by Queen Elizabeth in 1560; University College School, King's College School, City of London School, Mercers' School, and schools of the several city companies. Besides the above and numberless private schools, there are the City and guilds institutions for technical education, many high schools for girls, many free schools, numerous schools of the National Society, and more than 400 schools of the London School Board. Several polytechnics and centres of technical education have been equipped and supported by the London county council, who have also established a system of county scholarships for students, which promises to be of great value.

Scientific Associations, etc.—Associations for promoting science, art, learning, etc., are exceedingly numerous. The chief are the Royal Society, Burlington House, founded in 1660; the Society of Antiquaries, in the same building, originally founded in 1572; the Royal Academy (of painting, etc.), in Trafalgar Square, founded in 1768; the Royal College of Physicians, founded by Linacre, physician to Henry VIII., in 1518; the Royal College of Surgeons; the Royal Geographical Society, with a choice geographical library and large collection of maps; the Institution of Civil Engineers; the Royal Institute of British Architects, possessing a good library of architectural works; the Royal Institution of Great Britain, established in 1799; the Royal Horticultural Society, which possesses the botanic gardens in Regent's Park, as also at South Kensington and at Chiswick; the Royal Astronomical Society; the Royal Asiatic Society; the British Association; the Zoological Society, with its collection of animals in Regent's Park; the Geological Society, and the Anthropological Institute.

Hospitals and Charitable Institutions.—Besides the three great endowed hospitals: St. Bartholomew's, in West Smithfield; Guy's, Southwark; and St. Thomas', Lambeth, occupying a large and splendid range of buildings on the Thames Embankment opposite the Houses of Parliament; there are the London Hospital, St. George's Hospital, the Middlesex Hospital, Westminster Hospital, Charing Cross Hospital, King's College Hospital, University College Hospital, St. Mary's Hospital, and Royal Free Hospital, all with medical schools attached. Other general hospitals are: The Great Northern Hospital, the West London Hospital, and the Metropolitan Hospital; besides the German Hospital, Dalston; hospitals for special diseases, as consumption, fever, cancer; hospitals for women, for children, etc. Bethlehem Hospital (Bedlam), in St. George's Fields, south of the river, is the chief hospital for lunatics; St. Luke's Hospital is also for insane patients. The Foundling Hospital (see FOUNDLING) is rather an asylum for illegitimate children generally than a hospital for foundlings. Chelsea Hospital and Greenwich Hospital are institutions by themselves.

Prisons.—There are altogether about a dozen criminal prisons. The most celebrated of these, Newgate, near St. Sepulchre's Church, a gloomy and massive structure, the scene of a great many executions, was pulled down in 1903. Millbank penitentiary, or prison, an immense brick edifice with external walls enclosing upward of 16 acres, has also been demolished, and the site utilized partly for workmen's dwellings and partly for the Tate picture gallery. The chief existing prisons are Clerkenwell prison, the Wandsworth prison, Holloway prison, for females, debtors, etc.; the Westminster House of Correction, for female prisoners, in Tothill Fields, built on the Panopticon principle, with a courtyard in the centre 250 feet in diameter, and conducted on the silent system; the model prison, Pentonville, containing 1,000 cells, in which the inmates are taught useful trades; Wormwood Scrubs prison, a large building standing, almost isolated on the borders of London.

Squares and Public Monuments.— The squares of London are characteristic; many of them are of great beauty and extent, and planted with shrubbery. Among them are: St. James' Square, north of Pall Mall; Eaton, Belgrave (10 acres), Grosvenor, Portman, Cavendish Squares, all in the west end; Russell Square (10 acres), Bedford, Bloomsbury, Tavistock, and Euston Squares, in the west central part of the town; Trafalgar Square, at Charing Cross, fronting one of the principal thoroughfares and adorned with public buildings, fountains, the Nelson Column, and statues of Charles I., George IV., and others. The most conspicuous public monuments are: «The Monument,» on Fish Street Hill, London Bridge, a fluted Doric column 202 feet high, erected in 1677 in commemoration of the great fire of London; the York Column, at the south end of Waterloo Place, a plain Doric pillar of granite 124 feet high, surmounted by a bronze statue of the Duke of York; a fluted Corinthian column in Trafalgar Square, 176½ feet high, raised in honor of Nelson, and surmounted with a colossal bronze statue of the hero, having the pedestal decorated with bronze sculptures in high relief, and four magnificent lions, by Sir E. Landseer, at the angles; the Albert Memorial, Hyde Park, the most splendid and costly monument of recent times, being a Gothic structure 176 feet high, with a colossal seated statue of the prince under a magnificent canopy elaborately sculptured and adorned; and the projected magnificent memorial to Queen Victoria with its beautiful surroundings in front of Buckingham palace. There is a statue of the Duke of Wellington in front of the Exchange, and a statue of Sir Robert Peel at the top of Cheapside. Statues of Sir Charles J. Napier, Sir Henry Havelock, and General Gordon stand in Trafalgar Square. On the Thames Embankment, not far from the Temple, now stands the Egyptian obelisk known as Cleopatra's Needle; and west of it are statues of Robert Raikes, the founder of Sunday schools, General Outram, John Stuart Mill, and others. In Waterloo Place is a memorial to the Guards who fell in the Crimea, and here is also a statue of Sir John Franklin. An equestrian statue of the Duke of Wellington at Hyde Park corner was erected in 1888. A monument to Sir Hugh Middleton, who brought the New River water to London, has been erected on Islington Green. Among other memorials are: The Wesminster Crimean Memorial, in the open space at the west of the Abbey; the Peabody statue behind the Royal Exchange; an equestrian statue of Prince Albert in Holborn Circus, a statue of Carlyle on Chelsea Embankment, and of Lord Beaconsfield in Westminster Palace Yard.

The Parks.— Of these the finest and most fashionable is Hyde Park (q.v.), which lies between the Uxbridge and Kensington Roads, and contains about 400 acres. Kensington Gardens, with which Hyde Park communicates at several points, are beautifully wooded and finely laid out. Here carriages are not admitted. St. James' Park (83 acres) extends from Buckingham Palace to the Horse Guards, and in its centre is an ornamental sheet of water, studded with islets covered with trees and shrubs, and around which swim a great variety of aquatic fowls. The Green Park, 71 acres in extent, lies between St. James' Park on the south and Piccadilly on the north. Regent's Park, on the north side of London, covers an area of over 400 acres. Round the park is a drive nearly three miles long, and an inner circular drive encloses the Botanic Gardens. At the north end are the Zoological Gardens, to which a fine broad avenue leads along the centre of the park. Battersea Park is on the south bank of the Thames, opposite to Chelsea Hospital. Victoria Park is on the northeast of London, laid out and planted as a place of recreation for the poorer inhabitants of this part of London. Southwark Park is another artificially formed recreation ground. Greenwich Park is one of the most delightful features of South London, and has great natural beauties; the famous Greenwich Observatory is situated here. There are many other parks acquired for use of the public during late years. Brockwell Park in Camberwell, Ravenscourt Park in Hammersmith; Finsbury Park and Clissold Park on the north borders of London, are the most extensive. But even more typically a part of modern London are the numerous and beautiful heaths and commons preserved for the public. Hampstead Heath on the north, Blackheath and Plumstead Common on the southeast, and Totting and Streatham commons on the south are the most extensive.

Places of Popular Resort.— There are various places of popular resort in London. The Exhibition at Earl's Court, a vast open-air entertainment accompanied by exhibits of special descriptions arranged in courts and buildings within the grounds, is the largest. Olympia at Kensington is of less magnitude. The Zoological Gardens and the Botanical Gardens, both in Regent's Park, are very largely frequented. The People's Palace, established by contributions of the benevolent, in the East End of London (Mile-end road), and opened in 1887, provides a hall for concerts and other entertainments, a library and reading rooms, swimming baths, gymnasiums, social meeting rooms, winter garden, technical schools, etc., its object being the moral and intellectual improvement of the working classes of East London. Outside London there are other places of this description. The most important is the Crystal Palace (q.v.), at Sydenham, formed to a considerable extent of the materials of the exhibition building of 1851, removed from Hyde Park. It was originally designed as a great educational museum of art, natural history, and ethnology; and its gardens and fountains were to rival or surpass those of Versailles. For years music has taken an important place in the arrangements of the palace. Entertainments of merely amusing character have also been largely introduced. A somewhat similar building is the Alexandra Palace, occupying a conspicuous site on Muswell Hill on the north. Kew Gardens (q.v.) on the west and Hampton Court Palace (q.v.) and grounds, built by Cardinal Wolsey and enlarged by William III., further out toward the southwest.

Lighting, Sewerage, and Water.— London is supplied with gas by eight separate companies. These companies include in their area of supply a considerable district outside London. Since 1886 a large number of electric lighting companies have come into existence, in 1901, 16 companies and 15 local administrations possessing statutory powers to supply electricity. The sewerage works with which the Metropolitan Board was charged, were formally opened in 1865. The system consists of lines of intercepting sewers on both sides of the Thames intersecting the old outlets which are retained for service during heavy rainfalls. It consists of three main lines on the north of the river, at different levels, called respectively the High Level, Low Level, and Middle Level Sewers; and of two on the south side, called High and Low Level Sewers. The lines on the north side converge at the Lea river, whence, after the Low Level sewage has been pumped to the higher level, the whole flows in three parallel brick culverts, built in an embankment upward of 5 miles in length, on to the Northern Outfall and reservoir, about 14 miles below London Bridge. On the south side the Low Level sewage is pumped to the higher level at Deptford, whence the whole is conveyed to a point near the mouth of the river. The total length of the sewers is 82 miles, and the area drained is 120 square miles, together with sundry small districts, accommodated by the London system. Considerable extensions are in progress. Works have been established for precipitating the sewage; the deposit after precipitation, amounting to 5,000 tons daily, is carried out to sea and deposited several miles from land. The metropolitan water supply has been considerably amended of late years. There are eight companies supplying London and an extensive area around extending into Middlesex, Essex, Kent and Surrey. The total quantity of water supplied by these companies amounts to over 200,000,000 gallons daily. The largest quantity is supplied by the East London Company. Rather more than 113,500,000 gallons of this total is supplied from the Thames river, 55,250,000 from the Lea river, 33,500,000 from springs and wells. By an act passed in 1852 all the companies making use of the Thames are obliged to draw from above the limit of the tidal flow. Even above this point the water is not free from pollution by the sewage of numerous populous towns, and by the drainage of richly-manured land. Means are adopted for storing the water, and it is all filtered through layers of gravel and sand before entering the mains; but the system of supply is liable to various objections, and the total quantity is inadequate to meet the entire wants of the population. Commission after commission, and committee after committee, have examined and reported on this important subject, but in 1896, 1897, and 1898, the whole east end of London and much of the south suffered from want of proper water supply.

Cemeteries.— Extramural interment is of comparatively recent date. Kensal Green Cemetery, in which several royal personages have been buried, was opened in 1832; it occupies about 70 acres of ground, and is tastefully planted and laid out. Kensal Green Roman Catholic Cemetery occupies 30 acres. The cemeteries at Brompton, the Tower Hamlets, Bethnal Green, Nunhead, and Norwood are the only intramural places in which interments are permitted, excepting in the case of interments in St. Paul's and Westminster Abbey; and some of the cemeteries named would now be closed were they not provided with their special acts. At the Woking Cemetery, which occupies about 2,000 acres, the poor of several of the London parishes are buried, special railway accommodation being provided for cemetery traffic. Some of the parishes, as Marylebone and St. Pancras, and Paddington, have their own cemeteries. The City of London Cemetery is at Ilford, in Essex, and other cemeteries are also situated outside.

Communications.— The London population commands two systems of locomotion, namely, internal and external. The former has reference to the purely London requirements, and is by means of omnibuses, cabs, tramways, steamboats, and railways; the latter has reference to the connection of London with the rest of the kingdom and the Continent, and is by canals, railways, and the Thames. The internal traffic of London has become almost overwhelming. There are 12,000 cabs, 3,000 omnibuses, 1,200 tramway cars, besides the Metropolitan, the Metropolitan District and the Electric Railway systems, and the local systems on other lines. These are extending in all directions. The great English railways long ago reached the limit of their ability to cope with suburban traffic in and out of London. The old underground railway was designed to be complete in an inner and outer circle, but the outer circle was found to be insufficient before it was built, while the inner circle does not even touch what might be called suburbs. Yet so long as it was without competition the two companies owning this system drew great dividends and ignored the demands of their dependent patrons for better service. Not until competition arose in the shape of the Central London electric tube railway did the directors of the District and Metropolitan lines bestir themselves. American enterprise in acquiring control of the District Underground brought a flood of underground railway schemes forward, and parliamentary committes have been kept busy deciding between rival schemes. They have been careful to reserve all manner of rights to the government, refusing, for instance, to grant any route unless the proposed company agreed to provide and maintain a subway for pipes and wires along its line. This is an effort to unravel the tangle of such things which the least upturning of the streets shows. These lines are also refused complete independence of each other, and are compelled to arrange transfers and joint time tables. There are now 52 miles of deep railways running and authorized, estimated to cost £500,000 per mile. The great objection in London to shallow tram-subways, such as are now used in Paris and in New York, is the necessity of torn-up streets for a long period, as well as the difficulty of disposing of the soil so near the surface. The tubes, after the fashion of burrowing animals, must necessarily dispose of their soil at the end of their tunnel only. It is safe to predict that in ten years it will actually be possible to traverse London by public conveyance more quickly than one could walk or go in a cab. Now, for lack of means, or of co-operation when there is means, the task is hopeless. The number of passengers in one year traveling by omnibus is nearly 200,000,000, and by tramways nearly 300,000,000. Side by side with all this activity along the roadways, the Thames has almost been allowed to drop out of existence as a local travelers' route, for though small steamers ply from wharves and piers between Kew and Woolwich, the service is at present altogether inadequate. The principal railway stations are: The Great Eastern, Liverpool street, Bishopsgate; the London and North Western, Euston Square; North London, Broad street; Great Western, Paddington; the Great Northern, King's Cross; Midland, St. Pancras; Great Central, Marylebone; South Eastern, London Bridge, where there is a congeries of stations, Charing Cross and Cannon street; London, Chatham, and Dover, Ludgate Hill, and Victoria; the London, Brighton, and South Coast railway, Victoria and London Bridge; the South Western, Waterloo Bridge. Many of these stations communicate by the Metropolitan and District railways, distinct systems, but both popularly known as the «Underground,» affording means of internal communication within the city. Many of the termini are elaborate piles of costly architecture, and have associated with them large and handsome hotels. The Thames affords communication by steam vessels with the most important points on the British and Continental coasts, as well as with all parts of the world.

Manufactures.— It is impossible within the limits of this article to specify the different kinds of articles manufactured in London. It contains the largest breweries, distilleries, and sugar refineries in the kingdom; was long the principal seat of silk weaving; has extensive manufactures in metal, including machinery of all kinds, plate, jewelry, watches, and brass work and an enormous production of books and prints. Millinery, the making of clothes and of boots and shoes are also extensive branches of industry. Besides these, there are cabinet making, coopering, coach building, leather working, hat making, ship-building, rope making, mast making, etc., all of which are departments of manufacture conducted on a large scale; and there are numerous extensive chemical works, soap manufactories, and dye works.

Commerce, Docks, etc.— The port of London extends from London Bridge to the Nore and is divided into the Pool, Limehouse Reach, Greenwich Reach, Blackwall Reach, etc. It is under the care of the corporation of the city for sanitary purposes, under the Thames Conservancy for navigation, and under all sorts of other authorities for various other purposes. It is probably the worst managed port in the world. The docks, some of which are of great extent, are surrounded by wharves, sheds, storehouses, vaults, and warehouses of the most spacious kind. St. Katherine's docks, London docks, the West India docks, the East India docks, and the Millwall docks (in the Isle of Dogs) extend along the north side of the river at intervals from the Tower to Blackwall; and on the south side, between Rotherhithe and Deptford are the Surrey Commercial docks. The tide rises 18 feet at springs and 14 feet at neaps at the London docks; and the depth at low water, spring tides, on the outer sill of St. Katherine's docks is 10 feet. The largest of these older docks is the West India import dock, 2,600 feet long and 500 broad. The dock accommodation of the port was greatly increased by the construction of the Victoria and Albert docks, which follow next in order on the north side of the river (opposite Woolwich) and have a combined length of 2¾ miles, with a water area of 175 acres. The Victoria dock was opened in 1855, the Albert dock in 1880. The depth over the sill of the east entrance of the latter at high water is 30 feet. Besides these, there are now the splendid docks at Tilbury, on the Essex shore opposite Gravesend, constructed for the purpose of admitting the largest vessels at any state of the tide. Here there are a tidal harbor, graving dock, 3 miles of quays, sheds covering 20 acres, etc. The vessels belonging to the port in December 1900, numbered 1,252 sailing and 1,653 steam; aggregate tonnage, 1,716,616. Its exports of British and foreign produce in 1900 amounted to £91,502,552; the imports to £175,901,307. Out of 11,118 vessels that entered in the foreign and colonial trade in 1900, 5,999 were British, 1,343 Dutch, 1,133 Norwegian, 1,003 German, 444 Swedish, 369 Danish, 353 Belgian, 156 French, 124 Russian, 83 Spanish, 27 Italian, 22 Austro-Hungarian; 62 United States, the total of all foreign vessels being 5,119. For East and West India produce London is the great port; tea, sugar, tobacco, wine, corn, timber, tallow, hides, wool, and drugs form large items.

The amount of customs revenue received in 1900 was £11,388,560. The value of the imports is over one third, of the customs revenue about one half of the whole amount for the United Kingdom.

The following table gives particulars for 1900 of the shipping entering and clearing at the port of London from and to foreign countries and British colonies and coastwise:

1900	Sailing	Steam	Tonnage
ENTERED			
Foreign	1,443	7,965	7,153,431
Colonial	523	1,187	2,427,323
Coasting	4,094	10,602	5,972,147
Total	6,060	19,754	15,553,001
CLEARED			
Foreign	1,113	6,219	5,636,433
Colonial	235	536	1,483,240
Coasting	5,609	12,686	7,827,763
Total	6,957	19,441	14,947,436

Administration.— The most ancient civic officer of London is the lord-mayor of the city of London. He is annually elected from among the aldermen who have been sheriffs of the city, on 29 Sept. and installed in office on 9 Nov. when a procession takes place, called the lord-power. In the reign of Henry II. the walls on both sides of the river are described in a contemporary account as supplied with numerous towers. London Bridge, erected instead of a wooden one, was begun in 1176 and finished in 1209. This was to a great extent the same that was taken down in 1832. In 1218 the forest of Middlesex was cleared, and that portion of London north of the city began to be built. In the year 1328 the village of Southwark was incorporated with the city, as it had previously served as a place of refuge for malefactors. In 1349 and 1361 London was visited by the plague. In 1381 broke out the rebellion of Wat Tyler, who fell by the hands of the lord-mayor, hence the dagger on the city arms. In 1416 street lamps were introduced; in the same century some of the principal streets were paved, and wooden houses began to be replaced by others of brick. In the next century improvements were continued, and Westminster was connected with the city by a row of noblemen's mansions along the river, the last of which, Northumberland House, has made way for the road leading from Trafalgar Square to the Embankment. In the 17th century, Spitalfields was covered with houses, and the space north of the Strand as far as Holborn, and from Temple Bar to St. Martin's Lane was extensively built on, as well as the neighborhoods of Charing Cross and Pall Mall. The New River was completed and many houses were supplied with water; sewers were dug; smooth pavements were laid down for passengers, and hackney coaches came into general use. But the streets were so narrow and dirty and the houses in so filthy a state that the city was scarcely ever exempt from the plague, which sometimes committed great ravages. In 1666 the great fire broke out and spread over 336 acres, destroying 13,200 houses, 90 churches, and many public buildings. In rebuilding, considerable improvements were introduced, and a fire in Southwark 10 years after gave a similar opportunity of improving that district. Population and trade now rapidly increased, partly from the immigration of French Protestants driven from their country by the revocation of the Edict of Nantes. In the 18th century London steadily advanced in extent, prosperity and splendor. In 1780 took place the Gordon riots, when the mob was in possession of London for two days and committed frightful havoc. Since that disgraceful outbreak the peace of London has never been seriously endangered, and the troops stationed in and around the capital, together with the effective police force that now exists seem quite adequate to ensure it against any similar disturbance. The extension and improvements which took place during the 19th century are greater than at any former period, and further changes of great importance are in operation. The most remarkable event of the century in the history of London was the carrying into effect in 1851 of the first great truly international industrial exhibition, which has since led to numerous exhibitions of a similar kind both there and abroad. In 1862 took place the second great international exhibition, and since that time various exhibitions of an international character and largely representing the colonies have been held in specially constructed buildings at South Kensington. The history of London contains many episodes of vast importance to the nation as well as to London itself. As now united for government it will have to face problems of vast moment. The largest, most populous, and richest city that civilization has ever produced, the study of its history and its development must ever be of great importance and interest.

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London, Ohio, village, county-seat of Madison County; on the Pittsburg, C., C. & St. L. and the Cleveland, C., C. & St. L. R.R.'s; about 26 miles southwest of Columbus and 65 miles northeast of Cincinnati. It is situated in an agricultural region and its industries are mostly connected with farm products. The manufactures are agricultural implements, lumber, shoes, and cigars. It is the trade centre for a large part of the county and ships considerable farm products and live-stock. The village owns and operates the electric-light plant. Pop. (1900) 3,511.

London, Canada, the capital of Middlesex County, Ontario. A port of entry, on the River Thames, 121 miles west of Toronto. It has a fine appearance and is in one of the best agricultural districts of Canada. It is the diverging centre of four railways, the northern terminus of the London and Port Stanley Railway, on a branch of the Grand Trunk Railway from Saint Mary's, and is the chief station of the London, Huron, and Bruce Railway and a station of the Canadian Pacific Railway. It is lighted with gas and electric light and is a popular resort in summer for large numbers of invalids who take the benefit of the Sulphur Springs, famed for their medicinal qualities. London has 42 churches and 30 large colleges and public institutions, banks, newspapers, libraries, etc. The city has an excellent water supply. It has large manufactories, including furniture, carriages, woollen goods, fire engines, etc., stoves, tanneries, breweries, tinware, biscuits, etc., brass and iron foundries, and agricultural implements. Pop. (1901) 24,415.

Revised by J. CASTELL HOPKINS.

London Clay, in geology and palæontology, a formation of the Lower Eocene Age; so called from its existing at or near London, England. It consists of a tenacious brown and bluish-gray clay, with layers of concretions called septaria. It has a maximum thickness of 600 to 700 feet. Under the city the thickness of the clay varies with the valley of the Thames as affected by the erosion which formed it.

London, Treaties and Conventions of. The following are the most important of the treaties and conventions concluded in London in modern times: The Quadruple Alliance, formed 2 Aug. 1718. On 6 July 1827, a treaty

was signed between England, France, and Russia for regulating the affairs of Turkey and Greece, which led to the establishment of the Kingdom of Greece. On 22 April 1834, a quadruple alliance was formed between England, France, Spain, and Portugal against the claims of Don Carlos and Don Miguel to the crowns of Spain and Portugal. On 15 July 1840, a treaty was concluded between England, Russia, Austria, and Prussia to compel Mehemet Ali to restore Candia and Syria to the Porte; and on 27 November, at the conclusion of a short campaign by an Anglo-Austrian army in Syria, Mehemet Ali agreed to the terms of the treaty. A convention to close the Dardanelles against ships of war was signed on 13 July 1841; and a convention between France and England for suppression of the slave-trade, 29 May 1845. Austria, France, England, Prussia, Russia, and Sweden were parties to a treaty signed 8 May 1852, for settling the succession to the Danish crown, and guaranteeing the integrity of its dominions in relation to the duchies of Schleswig-Holstein. The rights of the German Confederation were reserved and the claims of the Duke of Augustenburg on the duchies relinquished on satisfaction. On 13 March 1871, at a conference of the great powers, the neutralization of the Black Sea, effected by the treaty of 1856, was abrogated. The neutralization of Luxemburg was guaranteed by the five powers at the conference of London, 11 May 1867. The Convention of London, which was concluded on 27 Feb. 1884, between the Transvaal and Great Britain, abrogated the Pretoria Convention of 3 Aug. 1881, and instead gave the Transvaal (thenceforward to be known as the South African Republic) independence in regard to its internal affairs, but reserved to the queen the right of veto over all treaties concluded «with any state or nation other than the Orange Free State,» or «any native tribe to the eastward or the westward of the Republic.»

London University, England, established as a joint-stock company in 1825, received in 1836 two charters, one for an association retaining the name of London University, and having power to examine candidates and grant degrees, and the other for a teaching body — the University College — entitling it to prepare students for the degrees conferred by the university. The object was to render academic honors accessible to all classes and denominations without distinction. The university became purely an examining body, granting degrees to all who passed the prescribed examinations, but not undertaking any teaching functions. An influential movement in favor of the establishment of a teaching university in the metropolis arose, however, and from 1888 commissions had the matter in hand, and in 1898 the London University Act was passed to give effect to their recommendations. A commission appointed to draw up statutes and regulations for the university in accordance with the act had its work formally ratified 29 June 1900, and the newly constituted university was established, the government granting the eastern and central portions of the Imperial Institute building to the university for its accommodation.

The eight faculties comprise arts, science, law, medicine, theology, music, engineering, and economics and political science, and the degrees conferred are LL.D., LL.B., M.D., M.B., M.S., B.S., D.Sc., B.Sc., D.Lit., M.A., B.A., D.Mus., B.Mus. Candidates for any degree must first pass the matriculation examination, for which the subjects are Latin, English, mathematics, general elementary science, and one other subject selected from a prescribed list, including Greek, French, German, Sanskrit, Arabic, elementary mechanics, chemistry, sound, heat and light, magnetism and electricity and botany. For the ordinary degrees of B.A. and B.Sc. two other examinations must be taken. In the faculty of arts the highest degree is Doctor of Literature. Examinations are held at provincial centres as well as in London. The schools of the University, or institutions in which instruction is given, are: University College and King's College in all faculties; Hackney College, New College, Regent's Park College, Cheshunt College, Wesleyan College (Richmond), London College of Divinity in theology; Royal Holloway and Bedford Colleges in arts and science; the Royal College of Science; the South-Eastern Agricultural College, Wye; the medical schools of St. Bartholomew's, the London, St. Thomas's, St. George's, the Middlesex, St. Mary's, Charing Cross, and Westminster Hospitals, the London School of Medicine for Women; the Central Technical College of the City and Guilds Institute; and the London School of Economics and Political Science.

The supreme governing body is the Senate, consisting of the chancellor, 4 members appointed by the crown, 17 members elected by Convocation, 1 of them being the chairman of Convocation, 2 each elected by the Royal Colleges of Physicians and of Surgeons, 1 appointed by each of the four Inns of Court, and 2 by the Incorporated Law Society, 2 each chosen by University and King's Colleges, 1 representing the Corporation of London, 2 appointed by the London County Council, 1 representing the City and Guilds Institute, and 16 elected by the faculties. The Senate is debarred from imposing any religious test, or from imposing any disability on the ground of sex. There are three standing committees of the Senate, namely, the Academic Council, the Council for External Students, and a board to promote the extension of university teaching. The Chancellor, Vice-Chancellor, and Chairman of Convocation are *ex-officio* members of all three committees. Convocation consists of the Chancellor, the Vice-Chancellor, the members of the three standing committees, and the registered graduates of the university of prescribed standing. The parliamentary representative of the university is elected by the duly qualified male members of Convocation.

Lon'donderry, Charles William Stewart Vane, 3d MARQUIS OF, British military officer and diplomat: b. Dublin, Ireland, 18 May 1778; d. London 6 March 1854. He served under Sir John Moore and Sir A. Wellesley, in the Peninsula, distinguishing himself there at Talevera and other battles, and was English ambassador to Berlin in 1813. He was ambassador to Vienna the next year, and minister-plenipotentiary at its Congress in 1815. By his marriage with Miss Vane he succeeded to immense estates in the county of Durham, and devoted himself to their improvement and to the welfare of his tenantry. Under his original name of Stewart he wrote the 'History of the Peninsular War' (1808–13); 'Narrative of the War in Germany and France, 1813–4' (1830); and edited the 'Correspondence' of Viscount Castlereagh, his brother (1850).

Londonderry, Ireland, a city, seaport, county borough, and assize town, in the county of the same name, province of Ulster, on the Foyle, 23 miles from its mouth and 124 miles by rail north-northwest of Dublin. Waterside, a suburb on the opposite river bank, is united to the city by the iron Carlisle Bridge, 1,200 feet long. The houses of the town rise on the hill tier upon tier, while the summit is crowned by the cathedral. The ancient portion of the city is surrounded by a wall 1,708 yards long. It contains a small square, called the Diamond, from which four main streets diverge. The walls are pierced by seven gates, giving communication with other parts of the town, the greater part of which lies outside the walls. The most important public buildings are the guildhall, the county court-house, the post-office, the custom-house, the harbor offices, the jail, Gwyn's Institution, the model school, Magee College, Foyle College, St. Columb's College, the school of science and art, the lunatic asylum, and Ebrington Barracks. The harbor is commodious, and vessels of large tonnage can discharge at the quay, which extends for nearly two miles along the river, and is provided with a graving-dock. An extensive foreign, colonial, and coasting trade is carried on with English and Scotch ports, while Glasgow transatlantic steamers call three or four times a week at the mouth of the river. The principal export is agricultural produce; the chief imports are timber, grain, iron, coal, flax-seed, flour, and guano. Shirt factories employ thousands of workers, and there are timber-mills, grain-mills, foundries, coach-factories, bread and biscuit factories, distilleries, and a ship-building yard. Intermediate education is supplied by Foyle College, founded in 1617, and by St. Columb's Catholic College. Magee College opened in 1865, besides teaching secular subjects, has a theological course adapted to young men studying for the Presbyterian ministry. The Protestant cathedral is inferior to many parish churches in England. The Roman Catholic cathedral is a massive and magnificent structure, opened in 1873. The population is about equally divided into Roman Catholics and Protestants. Derry originated in a monastic establishment founded by St. Columba in the 6th century. It remained an ecclesiastical settlement until 1566, when it was occupied by the English in their wars with the O'Neills of Ulster. In 1608 the place was burned and the English governor slain by Sir Cahir O'Dogherty, one of the Irish chiefs of Donegal. During the 20 years that followed, the corporation of London, who obtained a grant of the place from James I., rebuilt the city, surrounded it with a wall, fortified it with cannon, and gave it a new name. Henceforth it was known as Londonderry. Here the Protestants of Ulster took refuge at the revolution, and held the fortress against the forces of James II., the siege lasting from April till August 1689; the defense by untrained men against superior numbers being regarded as one of the most heroic and successful military actions of modern times. Pop. (1901) 39,873.

Lone Star State, The, a name given to Texas from the device on its coat of arms: one star, or a «lone star» in the centre of a wreath.

Lone Wolf (GUIPAGO), Indian chieftain of the Kiowa tribe: d. 1879. He became head chief of his tribe in 1866. He refused to bring the tribe into a reservation, in accordance with the Medicine Lodge treaty, until compelled to do so by General Custer in 1869. However, he continued to maintain an attitude of defiance, and finally headed the hostile portion of his tribe in the southern outbreak of 1874. The outbreak was finally quelled by General Mackenzie; Lone Wolf, with the other chiefs, surrendered, and in 1875–8 was held prisoner at Fort Marion, Fla.

Long, Charles Chaillé, American soldier: b. Princess Anne, Somerset County, Md., 2 July 1842. He served in the Union army in the Civil War and attained the rank of captain. In 1869 he was appointed lieutenant-colonel in the Egyptian army; in 1874 was made chief of staff to General Gordon, and employed on a diplomatic and geographical mission to the interior of Africa. Returning in 1877 to the United States, he studied at the Columbia Law School, and was admitted to the bar. He was appointed consul-general in Korea in 1887. He is the author of: 'Central Africa' (1876); 'The Three Prophets — Chinese Gordon, the Mahdi, and Arabi Pasha' (1884).

Long, Crawford W., American physician: b. Danielsonville, Madison County, Ga., 1 Nov. 1815; d. Athens, Ga., 16 June 1878. He was graduated from Franklin College, Pa., in 1835, and from the Medical School of the University of Pennsylvania in 1839, and after practising a short time in Jefferson, Ga., removed to Athens, Ga., in 1851. He claimed to have performed on 30 March 1842 the first surgical operation ever made while the patient was unconscious from inhaling ether. This appears to have been done in accordance with careful reasoning upon the subject, but although he repeated the experiment successfully in three other cases not far from that time the facts did not then become generally known. In December 1844 Dr. Horace Wells in Boston demonstrated practically the principle of anæsthesia by the use of nitrous-oxide gas, and in 1846 W. T. G. Morton followed him in a similar discovery, and publicly demonstrated the feasibility of employing anæsthetics in surgical operations. In 1902 the Georgia Medical Association proposed to place a statue of Long in the National Capitol as the discoverer of anæsthesia. See ANÆSTHESIA.

Long, Eli, American general: b. Woodford County, Ky., 16 June 1837; d. New York 1903. He was graduated from the military academy at Frankfort, Ky., in 1855, and received an appointment as 2d lieutenant in the 1st United States cavalry, serving in the Cheyenne expedition in 1857. During the Civil War he was in active service in the Federal army, was several times wounded, and was brevetted brigadier-general of volunteers in August 1864. He captured Selma, Ala., in April 1865. He was mustered out of the volunteer service in 1866 and retired as major-general. For many years previous to his death he had lived in Plainfield, N. J.

Long, George, English classical scholar: b. Poulton, Lancashire, 1800; d. 10 Aug. 1879. He was educated at Cambridge and was professor of classical literature in the Brighton Proprietary College 1849–71. He was famous for his thorough knowledge of Latin and Greek literature. He published admirable translations of ‹Thoughts of the Emperor M. Aurelius Antoninus› (1862–79) and ‹Discourses of Epictetus› (1877); as well as editions of Cæsar, Sallust and Cicero.

Long, John Davis, American lawyer and politician: b. Buckfield, Oxford County, Maine, 27 Oct. 1838. He was graduated from Harvard in 1857; taught in Westford Academy for two years; then studied law at Harvard law school and was admitted to the bar in 1861. He built up a large practice and became senior member of his firm, Long & Hemenway. He has been an active member of the Republican party; served in the Massachusetts legislature 1875–8, being speaker of the House from 1876–8, and was elected lieutenant-governor of the State in 1879; the next year he was elected governor, and re-elected in 1881. He was also for several years on the state house construction commission of the State. In 1883 he was elected to Congress, serving there till 1889; he was then a candidate for the Senate but was defeated, and did not hold public office till appointed secretary of the navy by President McKinley in 1897. He held this office through the Spanish War, conducting its affairs with marked ability, and resigned in March 1902. He published in 1879 a translation of the ‹Æneid› of Virgil.

Long, Stephen Harriman, American engineer: b. Hopkinton, N. H., 30 Dec. 1784; d. Alton, Ill., 4 Sept. 1864. He was graduated at Dartmouth College in 1809, and after teaching school entered the United States engineer corps in 1814. He taught mathematics at West Point 1814–16, and was subsequently engaged for several years in surveys of the country west of the Mississippi River, as well as of the Upper Mississippi. Long's Peak in the Rocky Mountains was named in his honor. When the construction of the Baltimore & Ohio railroad was commenced in 1827 Long became chief engineer of surveys and introduced many improvements in wooden bridges, to adapt them for railroad purposes. In the construction of railroads he established a system of curves in locating roads. He served for some years on the board for the improvement of the Mississippi, and in 1856 was placed in charge of that work. He was appointed colonel of engineers in 1863, retiring the same year.

Long, William Joseph, American Congregational clergyman and author: b. North Attleboro, Mass., 3 April 1867. He was graduated from Harvard in 1892 and from the Andover Theological Seminary in 1895. He is the author of: ‹The Making of Zimri Bunker› (1898); ‹Ways of Wood Folk› (1899); ‹Wilderness Ways› (1900); ‹Beasts of the Field› (1901); ‹Fowls of the Air› (1901); ‹Secrets of the Woods› (1901); ‹School of the Woods› (1902); ‹Following the Deer› (1903); ‹A Little Brother to the Bear› (1903).

Long Branch, N. J., city, in Monmouth County; on the Atlantic Ocean, and on the Pennsylvania, the New Jersey S., and the Central of New Jersey R.R.'s; about 35 miles by water, 45 miles by rail, and 30 miles in direct line south of New York city. During the summer season steamers run regularly several times a day between New York and Long Branch, and electric lines connect the nearby cities and towns with this famous summer resort. Long Branch is made up of large hotels, boarding houses, cottages, bathing houses, parks, stores, and places of amusement. It is well prepared to take care of the thousands of people who visit the place in the hot summer months. It has 16 churches, the Star of the Sea Academy, public schools, the Monmouth Memorial Hospital, a circulating library, and public reading rooms. The avenue along the bluff is a favorite walk. The long beach affords excellent bathing facilities. Large bulkheads have been erected to prevent destructions of the bluff by the action of the waves. The government is vested in a commission composed of seven members, who choose the mayor from among the number. Four of the commissioners are elected by wards, three at large, and all are elected annually. There are three banks with a combined capital of $200,000.

Long Branch is one of the oldest summer resorts in the United States. As early as 1670 settlements had been made along the coast. Colonel White of the British army, who owned the land where Long Branch is located and in the vicinity, about 1770, used to spend his summer months at this place. After the Revolution people from Philadelphia began to visit the place during the hot months, and in the last of the 18th century it had quite a reputation as a summer resort. Prior to its occupancy during the summer by people from New York and Philadelphia, it was frequented by fishermen and wreckers. Its proximity to New York, Philadelphia, and other cities gives it a large number of guests during the season. Pop. (1900) 8,872.

Chas. L. Edmonds,
Editor of Long Branch ‹Record.›

Long Island, New York, the southeasternmost portion of the State, connected by three bridges and several ferries across East River with Manhattan Island; is bounded on the north by Long Island Sound (q.v.), separating it mainly from the south shore of Connecticut. The Atlantic Ocean bounds it on the east and south, while The Narrows, New York Bay, and East River, already mentioned, connecting the ocean with the Sound, complete the boundaries on the west and northwest. Several small islands around the coasts are included in its political boundaries, the best known being Coney, Rikers, Berrian, South Brother, Fire, Barren, Shelter, Gardiner, Fisher, and Plum. Long Island has a maximum length of about 120 miles, varies in width from 12 to 23 miles, and has an area of 1682 square miles. It is divided into four counties, Nassau, Suffolk, Queens, and Kings, the last two metropolitan boroughs of New York city, occupying a considerable portion of the western end of the island. Queens County embraces the populous centres of Long Island City (q.v.), Maspeth, Corona, Flushing, Jamaica, Woodhaven, and Far Rockaway, while the boundaries of Kings County are those also of the former city, now the metropolitan borough, of Brooklyn (q.v.).

The 280 miles of coast line are indented with numerous bays and inlets. A deep bay, 30 miles long, divided into Great and Little Peconic, and Gardiner's bays, splits the eastern end of the island into two long narrow peninsulas, the southern terminating at Montauk Point, and the northern at Orient Point, with Plum and Fishers islands extending beyond. Great South Bay, from two to five miles broad, extends along the southern coast for nearly half the length; it is separated from the Atlantic Ocean by Fire Island or Great South Beach, a sandy strip from a quarter of a mile to one mile wide, communicating with the ocean by several openings. Jamaica Bay is on the south coast also, New York Bay on the west, while along the north coast are Flushing, Little Neck, Manhasset, Hempstead, Oyster, Huntington and Smithtown bays. A government system of lighthouses, life-saving stations, fortifications, and masked batteries extends around the coast.

The level seacoast of the south side, with its extended views of bay and the broad ocean, contrasts sharply with the hilly north side and its deep indentations, looking out upon the land-locked Sound. The rolling stretches of Montauk Point and Shelter Island afford another contrast to the many square miles of scrub oak and level sandy plains in the centre of the island. The island reaches a height of over 380 feet in West Hill, Suffolk County, and in Harbor Hill at Roslyn, the loftiest points in the range of glacial hills that extends along the northern coast. The island is well watered by several small streams, the Peconic, 15 miles long, flowing into Great Peconic Bay, being the largest. Natural ponds or lakes abound, and there are about 116 square miles of salt marsh throughout the island. The eastern portion especially is well wooded and noted for its pine forests well stocked with deer and other game. Like other insular positions the climate is milder than that of the adjacent continent, the average temperature being several degrees below that of the metropolis, while the hottest days are tempered by cool and refreshing breezes from ocean or Sound. The soil generally is productive and under a high state of cultivation. In the southern flat lands it is of a light, sandy nature, well calculated for raising grain, especially Indian corn; in the hilly north the soil is strong and adapted to the culture of grain, hay, and fruits. Market gardening for metropolitan demands constitutes the principal portion of the agricultural industry of Kings and Queens counties. Oyster, clam, and other fisheries are important sources of food supply.

The Long Island and other railroads give easy access from New York city to the remotest parts, Montauk Point, the southeasternmost point, being only three hours away. Long Island is noted especially for exceptional opportunities, embracing all sorts of summer recreation. The roadways are admirably adapted to all forms of locomotion, and riding, driving, automobiling, and wheeling, are equally desirable methods for enjoying the region. In the numerous villages and towns along Jamaica Bay, Great South Bay, Peconic Bay and the Sound. there are ample facilities for sailing, rowing, fishing, and bathing, which are fully utilized. For golfing, lawn tennis, and all other forms of outdoor sport and recreation, every possible facility is found, and the golf courses, especially at Garden City and Shinnecock, are notable. The chief seaside resorts along the south coast are Bath Beach, Bensonhurst, Coney Island, Brighton, Manhattan, Rockaway Beach, Far Rockaway, Long Beach, Fire Island, Patchogue, and Montauk Point; along the north coast are Greenport, Port Jefferson, Coldspring Harbor, Oyster Bay, Glen Cove, Seacliff, College Point and North Beach. The population of Long Island in 1900 was 1,452,611, 1,166,582 of this number residing in Brooklyn borough.

When discovered in 1609 by Hudson, Long Island was inhabited by 13 tribes of Algonquin Indians, by whom the island was variously called Panmancke, Wamponomon, Mautowacks, and Sewanhacky. A few descendants mixed with negro blood, and retaining no knowledge of their ancient language, dwell near Montauk Point and Shinnecock Neck. French Protestants from near the river Waal, in the Netherlands, made the first settlement in 1625 under Dutch protection, and immigrants from New England established themselves in different localities shortly afterward. Lange Eylandt, the Dutch name, was changed by the colonial legislature to that of Nassau, a name which survives in one of the counties, but was never adopted by the people for the island. Long Island was a busy base of military movements during the Revolutionary War, and the Battle of Long Island (q.v.) is the principal event in its history.

Long Island, Battle of, one of the early American defeats in the Revolutionary War, was fought 27 Aug. 1776, in Brooklyn, N. Y., mainly within the present limits of Prospect Park, the column in Battle Pass to the memory of the 400 Maryland troops who fell in the battle, and the foundation remains of the redoubt on Lookout Hill, marking the central point of defense and attack. After the evacuation of Boston by the British, Washington made strenuous efforts to fortify New York and its approaches. General Greene, in command of a considerable body of troops, mostly raw recruits, was entrusted with the defense of Long Island, and constructed a line of intrenchments and redoubts from Wallabout Bay to Gowanus Cove. The main works at the Wallabout end were on the hill afterward known as Fort Greene, now marked by Washington Park. At Gowanus Cove, a battery was erected at Red Hook, and a fort on Governor's Island, nearly opposite. About two and a half miles from the intrenchments, between them and the southwest side of the island, the range of low hills in this section was then densely wooded and crossed by three roads; one on the right of the works passing near the Narrows to Gravesend Bay, the central one through Flatbush, and the third far to the left through Bedford to Jamaica. In the midst of his preparations, General Greene fell ill, and the command devolved upon General Sullivan, then just returned from Lake Champlain. Unacquainted with the ground and with Greene's plans the change of command caused considerable confusion. Nine thousand British troops landed in Gravesend Bay on 22 August without resistance; they were commanded by Sir Henry Clinton, assisted by Lords Cornwallis and Percy, General Grant and Sir William Erskine. Lord Cornwallis, rapidly advancing to the central pass, found it occupied by the rifle regiment of Colonel Hand, and without risking an encounter, took up a position at Flatbush. Washington inspected the American lines on the 24th, and placed General Putnam in command. The following day the British were reinforced by two brigades of Hessian troops, under General De Heister, and on the 26th began to carry out their plan of operations. The road through Bedford to Jamaica unfortunately had been comparatively neglected by the Americans, and eluding the patrol, the British contingent under General Clinton, accompanied by General Howe, the commander-in-chief, and by Lords Percy and Cornwallis, guided by a local tory, gained possession of the road and neighboring heights undiscovered during the night of 26–7 August. In the morning General Grant, with the left wing of the British army, advanced along the road by Gravesend and the Narrows, and was resisted by Colonel Atlee with a guard of Pennsylvania and New York militia, who retired fighting until he had fallen back upon General William Alexander (Lord Stirling), whose two regiments had hastened to his assistance. Here active firing was kept up by both sides without an attempt at a general action. At the same time, as diversions, De Heister opened up a cannonade from Flatbush upon Colonel Hand and his riflemen, while the guns of the British war-vessels were trained upon the Red Hook battery. Meanwhile on the right Clinton opened his guns upon the Americans, and at this signal De Heister advanced to storm the central pass and the redoubt of which General Sullivan had taken command. The latter, who found his left flank engaged and himself in danger of being surrounded, ordered a retreat, but not soon enough to escape the British light infantry, who drove him back upon De Heister and his Hessians. The Americans fought with desperate valor, a large body cutting their way through the intrenchments, the rest who were not killed either escaping among the hills or surrendering as prisoners, among the latter being General Sullivan. On the left Colonel Atlee and Lord Stirling, who had maintained their position in front of General Grant, found themselves cut off by Cornwallis. They gallantly attacked the enemy with such determination that the British held their ground only by the assistance of reinforcements, when Stirling seeing the uselessness of further resistance surrendered. Having forced all the approaches the British proceeded to invest the American works.

Washington arrived in the evening and took command, the following day bringing over additional troops. But with the formidable British force opposed to him, and indications that the British fleet intended moving up the river so as to cut the force in Brooklyn entirely off, Washington, on the night of 29–30, favored by a thick mist, made a strategic and masterly retreat to Manhattan, greatly to the discomfiture of the British, who were unaware of the movement until some time after the last American had crossed in safety. The Americans lost over 900 men in the battle, while the British loss in killed wounded and missing was 400. Consult: Carrington, 'Battles of the American Revolution' (1876); Dawson, 'Battles of the United States' (1858); Field, 'Battle of Long Island' (1869).

Long Island City, N. Y., formerly a city in Queens County, and second in size on Long Island, now in the borough of Queens, in New York city. It became a part of New York 1 Jan. 1898. As early as 1640 Dutch settlers had taken possession of the land in this vicinity, and gradually a number of little villages were formed on the western end of the island, on the East River and the Sound. In 1870 a number of the little villages, Astoria, Blissville, Dutch Kills, Hunter's Point, Middletown, Ravenswood, and Steinway, were united into one municipality and called Long Island City. Newtown Creek separates this section from the borough of Brooklyn. Ferries connect it with the borough of Manhattan. It has extensive manufacturing interests, several hospitals, a large number of churches, and schools. Consult: Kelsey, 'History of Long Island City.'

Long Island Sound, a body of water which separates Long Island, in New York State, from the mainland. It is an arm of the Atlantic Ocean, extending northeast and southwest; about 110 miles long and from 10 to 25 miles wide. It is connected with the Atlantic on the east by The Race, a narrow passage south of Fishers Island; and on the west by a strait called the East River, which enters New York Bay and through the Narrows to the ocean. The coast on the north is irregular, and has a number of small bays and capes. The south or Long Island coast is irregular from East River to near Port Jefferson; and from Port Jefferson to Orient Point the coast line has few indentations. The largest indentations on the north side are New Haven Harbor and Pelham Bay. There are several good harbors at the mouths of rivers and in places sheltered by small islands. On the south shore the principal indentations are Smithtown, Northport, Oyster, Manhasset, Little Neck, and Flushing bays. The north coast is fringed by small rocky islands or reefs. In the western part of the Sound there are a number of small islands, which have been improved so as to be desirable resorts or residential locations. Chief among these are Glen Island and City Island. At the entrance to East River there are a number of islands used chiefly by the health department of New York city. At the east entrance is a group of islands which extend diagonally from Long Island to the State of Rhode Island. The largest of this group is Fishers Island. (See New York City.) The chief rivers which flow into the Sound, all from the north, are Connecticut, Mystic, Thames, and Housatonic.

Since the improvements made (1865) at Hell Gate (q.v.), Long Island Sound is an available route for ocean steamers. The large passenger steamers which ply daily between New York and New England ports pass through the Sound. A large number of forts with modern equipment are located along the shores, thus guarding most carefully the entrance to New York city by this route.

Long Parliament, in English history, a Parliament summoned by Charles I. in 1640. Largely liberal and anti-royal, thanks to the campaigning efforts of John Pym, it declared ship-money illegal, claimed the right of taxation as belonging solely to the Commons and not to the Crown, passed the Triennial Bill, and, attacking the King's favorites put Laud in prison and Strafford to death. In November 1641, passing successfully a reactionary crisis, it adopted the Great Remonstrance, and in January of the next year refused to obey the king's order to surrender «the five members,» its leaders, Hampden, Pym, Hollis, Haselrigg and Strode. Thus it brought on the Civil War, through which it continued in power, losing however many members upon the introduction of Presbyterianism, and nearly 100 Presbyterians in 1648 after its attempted compromise with the king, which aroused the anger of the Parliamentary army. The handful of members left composed the «Rump,» which was nominally in power until dissolved in 1653 by Cromwell, after whose death it briefly reconvened in 1659 and 1660. See CROMWELL.

Long-tailed Duck. See OLD SQUAW.

Long Tom, (1) the name given a 42-pound gun captured by the British in 1798 from the French battleship Hoche. It was afterward purchased by the Americans and used in the attack on Haiti by the French in 1804, and remained idle till 1812, when it was placed on the General Armstrong. This vessel ran the British blockade at New Orleans 9 Sept. 1814, and put into the bay near Horta, Fayal, being disabled in an encounter with a British squadron. Here the gun was dismantled and remained till Colonel Reid, son of the commander of the General Armstrong, had it brought back to New York 18 April 1893. (2) An apparatus for washing gold from the earth or gravel in which it is found. It consists of a wooden trough, from 12 to 25 feet long and about a foot wide. At its lower end it widens, and its floor there is of sheet-iron pierced with holes half an inch in diameter, under which is placed a flat box a couple of inches deep. A stream of water is kept running through it by means of a hose; the dirt is shoveled in, and stirred at the lower end, where the earth and gravel fall through the sieve into another box, where they are again sifted. The machine, like the «rocker,» was cheap and wasteful; and both were soon displaced by the sluice.

Long'acre, James Barton, American engraver: b. Delaware County, Pa., 11 Aug. 1794; d. Philadelphia 1 Jan. 1869. He was apprenticed in Philadelphia, and in 1819–31 was employed in the illustration of many of the foremost American works then published. At first with James Herring, and later independently, he published the ‹National Portrait Gallery of Distinguished Americans› (1834–9), many of whose engravings were from sketches by himself. In 1844 he was appointed engraver to the United States mint, and from that time until his death designed all new coins. He also remodeled the coinage of Chile.

Lon'gan, a tree and its fruit. See LITCHI.

Longard de Longgarde, Dorothea. See GERARD DOROTHEA.

Longchamps, lôṅ-shŏṅ, Paris, France, a celebrated racecourse on the southwest side of the Bois de Boulogne, where the race for the «Grand Prix» is run. Prior to its suppression in 1792, part of the site was occupied by the Convent of Longchamps, founded in 1260, a not too rigid retreat for ladies of the higher classes. It was a popular resort for carriage driving, especially during the week preceding Easter.

Longe, a local name (Vermont) for the lake trout (q.v.).

Longevity, lŏn-jĕv'ĭ-tĭ. The duration of life varies greatly in the same group of plants and animals, and great age in animals is by no means confined to the few higher vertebrates, such as the elephant, crocodile or parrot. Even so lowly an organism as the sea-anemone has been kept alive for 55 years. Low herbaceous annual plants in the temperate zone, have co-species in the tropics which grow to be trees and are perennial. Not only are individuals of a species long-lived, but certain species and genera exhibit wonderful vitality and have persisted throughout many geological ages, such are *Lingulella, Limulus, Ceratodus,* and certain foraminifers which have persisted since the Silurian period.

Causes of Longevity.— They have to do with the nature of the physical surroundings, and also depend on slow growth and late reproduction. Botanists find that great age in plants is dependent on slow growth, gradual propagation carried on late in life, on the solidity and hardness of the tissues, etc. Examples of great age in plants are the Sequoias or «big trees» of California, which are supposed to be over 3,000 years old; in fact, they are survivors of Tertiary times, since they occur in a fossil state in the polar regions in British Columbia and in Europe.

The longevity of certain species of animals has been attributed by Weismann to favorable environment, including temperature. He considers that the duration of life depends first upon the length of time which is required for the animal to mature, and upon the length of the period of fertility, the latter point being determined by external conditions. Undoubtedly another factor is heredity, since longevity is directly transmissible from parent to offspring, and great age runs in families.

As to longevity in the lower animals little is known. As a rule, they live but a few weeks, months, or years. The crayfish is said to attain an age of 20 years, and possibly the lobster may live to be as old as that. Lampreys preserved in Roman fish-ponds are said to have lived to be nearly 60. The crocodile, which never stpos growing through life, lives 100 years. Pike and carp reach the age of 150 years. A gigantic salamander of Japan lived at least 52 years in confinement in Germany. As to the age of birds a writer in the British ornithological journal ‹Ibis,› states that the following records of birds in captivity are authentic: raven 50, gray parrot 40 and 50, blue macaw 64, eagle-owls 53, and one was then still alive at 68 years. Certain aquatic birds are very long-lived, as a heron of 60, goose 80, mute swan 70. A goose still living in Rhode Island in 1903 is known to be 50 years of age. To what age in free nature these birds may reach is unknown. The elephant is known to live a century and the whale is supposed to be equally long-lived. The horse rarely reaches the age of 40, though according to Lawrence «Old Billy» of Manchester was known to have lived 59 years, and died at the age of 61, while Albertus, an old veterinarian, writes that he knew a soldier actually serving upon a horse which was 70 years of age.

Man sometimes reaches the age of 100 years, and in rare instances even exceeds that age; while heredity undoubtedly has most to do with great age, it may be promoted in those of medium height by quiet, regular habits, moderation in eating and abstention from or moderation in the use of stimulants and tobacco. Women attain a greater age than men. To show that in man the mean duration of life may be extended by good sanitation and improvement in the general conditions of life, the mean duration of life in France has risen from 29 years at the close of the 18th century to 40 years. The United States census report for 1900 on deaths that occurred in 271 cities of 5,000 population or more shows that 18.6 persons died in 1900 out of every 1,000, whereas in 1890 the number who died in the same cities was 21 out of every 1,000. The average age at death in 1890 was 31.1 years; in 1900 it was 35.2 years. If these statistics be accurate the saving of human life that has been achieved in a decade is enormous. Consult: Weismann, ‹Essays upon Heredity, etc.› (Oxford 1889); Lankester, ‹On Comparative Longevity in Man and the Lower Animals› (London 1870); Lolaville, ‹The Duration of Human Life,› in the ‹Popular Science Monthly,› Vol. XX., November 1881.

Long'fellow, Ernest Wadsworth, American artist: b. Cambridge, Mass., 1845. He studied under Couture in Paris, and among paintings by him may be named: ‹Italian Pines›; ‹Misty Morning›; ‹John and Priscilla›; ‹Old Mill at Manchester›; and a portrait of his father, Henry W. Longfellow, the poet.

Longfellow, Henry Wadsworth, American poet: b. Portland, Maine, 27 Feb. 1807; d. Cambridge, Mass., 24 March 1882. His father, Stephen Longfellow, was a prominent and cultured lawyer of Portland, having graduated from Harvard College, with Dr. Channing and Joseph Story, in 1798. He married Zilpah Wadsworth, daughter of Gen. Peleg Wadsworth, who fought in the Revolution, in 1804. The poet's mother was singularly imaginative and sympathetic, and fond of poetry and music. Henry was the second of four sons and of eight children. At 15 he entered the sophomore class at Bowdoin College, and discovered much taste for literature, and unusual facility in verse. After his graduation in 1825, he was selected as the most promising candidate for the newly established professorship of modern languages at Bowdoin, and was sent to Europe to prepare for the work. He traveled and studied in France, Spain, Italy, and Germany, and acquired considerable linguistic knowledge in the three years of his stay. In 1829 he returned and took up his duties, which were onerous, involving the preparation of elementary text-books in French and Spanish. In 1831 he married Mary Storer Potter, daughter of Judge Barrett Potter, and a schoolmate of earlier years. He wrote for the ‹North American Review,› and began to contribute to the ‹New England Magazine› some of the papers from the ‹Sketch Book of Scenes in France, Spain, and Italy,› which he had prepared abroad. These were collected and issued as the two parts of ‹Outre-Mer› in 1835. Two years earlier he had published his translation of ‹Coplas de Manrique,› prefaced by his article from the ‹North American Review› on ‹The Moral and Religious Poetry of Spain.› This little book attracted the attention of George Ticknor, then about to resign the professorship of modern languages in Harvard College, and seems to have had much to do with making its author his successor. The position was tendered and accepted, and Longfellow sailed, accompanied by his wife, in the spring of 1835, for a year of further study abroad. By way of London, where they met the Carlyles and other literary people of note, they went to Copenhagen and Stockholm, for study of the Scandinavian languages, which detained them till the close of the year. In December, on their way to the south, Mrs. Longfellow died at Rotterdam. Longfellow spent the winter and spring at Heidelberg, finishing the year in Switzerland and the Tyrol. He began his work at Cambridge in December 1836, taking lodgings at Cragie House, where Washington had his headquarters in the first year of the Revolution. In 1839 appeared ‹Hyperion,› containing, in a somewhat sentimental vein, the cherished thoughts and impressions of his stay in the Tyrol and Switzerland, and also ‹Voices of the Night,› his first volume of verse. The latter work was conspicuously successful, and did much to strengthen the influences that were drawing him away from teaching and from prose tasks. After two years of further service, he was forced, by the state of his health, to ask for a leave of absence, and in the spring of 1842 sailed again for Europe, returning somewhat benefited late in the year. He employed his time, during the return voyage, upon a series of ‹Poems on Slavery,› which was at once published, and led to some unkindly criticism. In 1843 Longfellow married Frances Elizabeth Appleton, daughter of Nathan Appleton, a Boston merchant. This year he published ‹The Spanish Student,› a drama in three acts, and in 1845 his ‹Poets and Poetry of Europe,› as also, in 1846, ‹The Belfry of Bruges, and other Poems.› This was followed in 1847, on a theme suggested by Hawthorne, by the famous ‹Evangeline.› Two years later he produced ‹Kavanagh,› a somewhat artificial story of New England life, and in 1850 ‹The Seaside and the Fireside,› which was followed the next year by ‹The Golden Legend.› In 1854 Longfellow gave up the cares of his professorship, that he might write, and at once began serious work upon his long-delayed translation of Dante, and on an Indian poem that he had not yet named. This latter, eventually called ‹Hiawatha,› was finished near the close of the year. In 1858 appeared ‹The Courtship of Miles Standish,› which showed increased skill in the handling of hexameters, and was very favorably received. In July 1861 Mrs. Longfellow died from injuries caused by the burning of her gown, ignited by a dropped match. After two years, ‹Tales of a Wayside Inn› appeared, and in 1867 ‹Flower-de-Luce,› and the first part of ‹Dante's Divine Comedy.› This translation was fully published in 1870. In 1868 ‹The New England Tragedies› was finished. This year, with a family party, Longfellow sailed for England, receiving everywhere the honors of the country, and in special the degrees of LL.D. from Cambridge and D.C.L. from Oxford. The party traveled through Switzerland to Italy, returning to America by way of Scotland in September of the next year. Longfellow began work again industriously, bringing out ‹The Divine Tragedy› in 1871, and ‹Christus,› and ‹Three Books of Song› in 1872. In 1874 appeared ‹Aftermath,› and the year after ‹The Masque of Pandora and other Poems.› In 1876 was published the first number of ‘Poems of Places,’ which ran up to 31 eighteenmo volumes, and occupied three years in the editing. He had twice essayed similar collections, ‘The Waif’ (1845), and ‘The Estray’ (1846), many years before. In 1878 he published ‘Keramos, and other Poems,’ and in 1880, ‘Ultima Thule.’ In October of 1881 he was seized with vertigo, followed by nervous prostration, which stopped all further work, and in March of the next year he succumbed to an attack of peritonitis of less than a week's duration. He was a man of an impressionable and sprightly nature, and of great sweetness and purity of life, knowing neither enemies nor rivals. His genius was essentially lyrical, and his refined facility in literature gave him his capital rather than his powers of analysis and of thought. He is the first of American and perhaps of modern English poets in popularity and a hundred translations from his work have been made in eighteen leading languages of the world. Consult: S. Longfellow, ‘Life of Henry W. Longfellow’ (1886), and ‘Final Memorials of Henry W. Longfellow’ (1887); Robertson, ‘Longfellow’ (1887); Wendell, ‘Literary History of America’ (1900); Carpenter, ‘Henry Wadsworth Longfellow’ (1901); Higginson, ‘Longfellow’ in ‘American Men of Letters’ series (1902).

L. A. Sherman,
Of the University of Nebraska.

Longfellow, Samuel, American Unitarian clergyman and poet: b. Portland, Maine, 18 June 1819; d. Cape Elizabeth, Maine, 3 Oct. 1892. He was a younger brother of H. W. Longfellow, and was graduated from Harvard in 1839 and from Harvard Divinity School in 1846. After his ordination to the ministry he was pastor of the Unitarian Church at Fall River, Mass., 1848–51; of the 2d Unitarian Church in Brooklyn, L. I., 1853–60; and of the Unitarian Church at Germantown, Philadelphia, 1877–82. His remaining years were spent in Cambridge. His fame as a poet has been overshadowed by that of his brother, but he had a very distinct poetic gift, and his hymns, of which he wrote many, are among the best of modern religious lyrics and are found in hymnals of many denominations. He possessed a gentle, unaggressive nature, but held his convictions firmly, nevertheless, and was fearless in the expression of his religious and poetical opinions, his views being more often radical than conservative. His published works include: ‘A Book of Hymns,’ with S. Johnson (1846), a compilation revised in 1864 as ‘Hymns of the Spirit’; ‘Thalatta: a Book for the Seaside,’ with T. W. Higginson (1853), a verse compilation partly original; ‘Life of Henry Wadsworth Longfellow’ (1886); ‘Final Memorials of Henry Wadsworth Longfellow’ (1887); ‘Essays and Sermons’ (1894); ‘Hymns and Verses’ (1894). Consult: May, ‘Memoir and Letters of Samuel Longfellow’ (1894).

Longfellow, William Pitt Preble, American architect: b. Portland, Maine, 25 Oct. 1836. He is a nephew of Henry W. Longfellow (q.v.), and was graduated from Harvard in 1855. He was assistant architect of the Treasury Department 1869–72; is a fellow of the American Society of Architects, and was the original editor of ‘The American Architect.’ He was chairman of the architectural section of the Board of Judges of the World's Columbian Exposition, 1893. He has published: ‘Abstract of Letters on Perspective’ (1889); ‘Cyclopedia of Architecture in Italy, Greece and the Levant’ (1895), a work of great value; ‘The Column and the Arch’ (1899); ‘Architectural Essays.’

Long'fin, a large and important sea-fish (*Chilodactylus macropterus*) about the Cape of Good Hope. It represents a family, having several other food-fishes of value in the Indian Ocean and Australian seas, all characterized by elongation of one of the rays of each pectoral fin.

Longhena, Baldassare, bäl-däs-sä'rā lōn-gā'nä, Italian architect: b. Venice about 1604: d. there 1682. He carried to its highest pitch the Venetian baroque, in which he followed to some extent his predecessors Palladio and Scamozzi. In the plastic accessories of his buildings he was far less original. He built in 1631–56 the great church of Santa Maria della Salute (commonly called «The Salute»), an octagonal structure with two domes. The churches of Santa Giustina, San Tomà, and Santa Maria ai Scalzi; the Palazzo Rezzonigo and the staircase of the cloister of San Giorgio Maggiore were also his work.

Longhi, Giuseppe, joo-sĕp'pĕ lŏng'gē, Italian engraver and painter: b. Monza 13 Oct. 1766; d. Milan 2 Jan. 1831. He studied line-engraving in the school of Vangelisti at Milan, was for a time at Rome, but later established himself at Milan, where he was a professor in the Academy from 1798. He was unexcelled among contemporary engravers in excellence of portraiture. Among his plates are: ‘Bonaparte’ after Gros; ‘The Philosopher’ after Rembrandt; ‘The Vision of Ezekiel’ after Raphael; ‘Washington’ after Stuart; ‘Eugène Beauharnais’ after Gérard; and ‘The Emperor Franz I.’ after Schiavoni. He published ‘Teoria della Calcogrofia’ (1830), once well known.

Longicornes, lŏn-jĭ-kôr'nēz, or **Long-horned Beetles.** See Cerambycidæ.

Longino, Andrew Houston, American lawyer: b. Lawrence County, Miss., 16 May 1855. He was graduated from Mississippi College, Clinton, Miss., in 1876 and until 1880 was clerk of the circuit and chancery courts for Lawrence County. He was elected to the State senate in 1880 and in the following year was admitted to the bar. He served until 1884 in the State senate and was appointed district attorney for southern Mississippi and in 1894 became chancellor. He was elected governor of Mississippi for a term of four years in 1900.

Longinus, Cassius, Athenian Neoplatonic philosopher and rhetorician: b. about 213 A.D.; d. Palmyra, Syria, 273 A.D. Greek literature was the principal subject of his studies. He studied the philosophy of the day under Ammonius Saccas at Alexandria, but subsequently became an ardent adherent of the Platonic philosophy, and annually celebrated the birthday of its founder by a banquet. He afterward visited the East, and on the invitation of Queen Zenobia went to Palmyra to instruct her in Greek learning and to educate her children. On the death of her husband he was employed by her in the administration of the state, and advised her to throw off the Roman yoke, by which means he was involved in the fate of this queen. For when Zenobia was taken prisoner by the Emperor Aurelian, and could save her life only by betraying her counsellors, Longinus, as the chief of them, was seized and beheaded 273 A.D. He suffered death with all the firmness of a philosopher. He was distinguished by his oratory as well as his statesmanship and love of liberty. He appears to have known Latin and Syriac as well as Greek. The work known as 'Longinus on the Sublime,' the best piece of literary criticism in the Greek language, was written either by him or by a certain Dionysius Longinus, whose date is the 1st century after Christ.

Longitude, lŏn'jĭ-tūd, of a heavenly body, is the angle between two planes, both of which are at right angles to the ecliptic, and pass through the sun (heliocentric longitude), or through the earth (geocentric longitude). The longitude of a place on the earth is the angle between the meridian through the place and some fixed meridian. At the Geodetic Congress held in 1884 at Washington, and composed of scientific representatives from the principal countries of the world, it was resolved to adopt the meridian of Greenwich as the universal prime or first meridian, the representatives of France being the only important objectors. Longitude, or the angle between two meridians, may be measured by the arc of the equator, or of any parallel intercepted between them. As the parallels get smaller toward the poles, it is evident that degrees of longitude which are 69½ statute miles long at the equator get shorter toward the poles. At all places of the same latitude the length of a longitude degree (measured due east and west) is the same. All methods of determining longitude are based on this fact. (1) A method formerly employed to determine the difference in longitude between two land stations was to carry chronometers backward and forward a number of times from one place to the other until the effects of variation of rate had been eliminated; comparison of their indications with the sidereal times at the places gave the longitude. (2) A ship carries a chronometer indicating Greenwich time; the local time at any place is known from observation of the sun, hence the longitude of the place may be calculated. (3) The Nautical Almanac gives the Greenwich time at which the moon is at certain distances from certain stars; mariners note the local time at which the moon is at the same distances from these stars (they are aware of the local time from observation of the sun in the daytime), and so the longitude is known. (4) The eclipses of Jupiter's satellites are seen by all observers on the earth at the same instant; their Greenwich times being noted in the Nautical Almanac, and their local times being observed as in method (3), the difference in time from Greenwich is known. The tables of these eclipses are not yet complete enough for this method to be in great use. Observations of lunar transits and the occultation of fixed stars afford other means of determining longitude. See also LATITUDE.

Longley, James Wilberforce, Canadian politician: b. Paradise, Nova Scotia, 4 Jan. 1849. He was educated at Acadia College, N. S., studied law in Halifax and was called to the bar in 1875, becoming Queen's Counsel in 1890. He was chief editorial writer for the 'Acadian Recorder' 1873-87, and was managing editor of the Halifax *Morning Chronicle* (1887-91). Since 1882 he has been a member of Nova Scotia Assembly and in 1886 was made attorney-general. He materially assisted the passage of the bill for the abolition of imprisonment for debt.

Long'mans, London publishers for many years identified with high-class literature. Thomas Longman (1699-1755) was apprenticed to John Osborne, bookseller, Lombard Street. Longman bought the business of William Taylor, publisher of 'Robinson Crusoe,' conducted in Paternoster Row, whence he moved in 1726 to the present site. Longman was a shareholder in many important publications, such as Boyle's 'Works,' Ainsworth's 'Latin Dictionary,' Chambers' 'Cyclopedia,' and Johnson's 'Dictionary.' His nephew and successor, Thomas Longman (1731-97), published a new edition of Chambers'. With Thomas Norton Longman (1771-1842) the firm reached a high degree of literary and commercial prosperity. Lindley Murray's 'Grammar' was published and proved valuable, while the firm had literary connection with Wordsworth, Southey, Coleridge, Scott, Moore (to whom it paid £3,000 for 'Lalla Rookh'), Sidney Smith, and other leading authors. In 1826 the 'Edinburgh Review' became the property of Longmans. The next important members of the firm were Thomas Longman (1804-79), the eldest son of T. N. Longman who issued a beautifully illustrated New Testament, and William Longman (1813-77), the third son, who wrote 'Lectures on the History of England' (1859); 'History of the Life and Times of Edward III.' (1869); and 'History of the Three Cathedrals of St. Paul' (1873). The events of this generation were the publication in succession of Macaulay's 'Lays of Ancient Rome' (1842); 'Essays' (1843); and 'History.' The famous check for £20,000 paid to Macaulay as his share of the profits of the 3d and 4th volumes for the first few months (1855) is still preserved. The partners of the fifth generation were Thomas Norton Longman and George Henry Longman, sons of Thomas Longman, and Charles James Longman and H. H. Longman, sons of William Longman. One of the earliest ventures of this time was Disraeli's 'Endymion,' for which the author received £10,000. Lord Beaconsfield's other works had come into possession of the firm in 1870, when they published his 'Lothair.' A magazine —'Longman's'— was also established by the house.

Longobardi, lŏn-gō-bär'dī. See LOMBARDS.

Long's Peak, one of the highest elevations of the Rocky Mountains, in Colorado, about 48 miles northwest of Denver. Its height is 14,271 feet. It was named in honor of Col. Stephen Harriman Long (q.v.).

Long'spurs, a group of large finches, typically of the genus *Calcarius*, distinguished by the great size of the claw of the hind toe. All are northern birds, frequenting open lands and inclined to form into flocks. The Lapland longspur (*C. lapponicus*) is known throughout the northern parts of Europe and Asia as well as America, and breeds only in the extreme north, coming south of the area of deep snow in winter, but always rare and irregular in the United States. Three other species are restricted to

North America, one of which, the chestnut-collared (*L. ornatus*) is well-known in the West, as it breeds abundantly on the plains of Dakota and Montana, making its nest on the ground. All are handsome birds, with a mixture of colors, in which black, chestnut, red and buff are conspicuous. Detailed descriptions of all may be found in Dr. Coues' ‹Birds of the Northwest› (1874).

Long'street, Augustus Baldwin, son of William Longstreet (q.v.), American jurist and author: b. Augusta, Ga., 22 Sept. 1790; d. Oxford, Miss., 9 Sept. 1870. He was graduated at Yale College in 1813, began the study of law at Litchfield, Conn., and was admitted to practice in Georgia in 1815. In 1821 he represented the county of Greene in the legislature, and in 1822 was made judge of the superior court of Ocmulgee circuit. Declining re-election to the bench, he returned to the bar, and was especially distinguished for his efforts and successes in criminal cases. In 1822 he removed to Augusta, Ga., and founded the ‹Sentinel.› In 1838 he entered the ministry of the Methodist church, and was president of Emory College 1839–48 and subsequently of the University of Mississippi. His works include: ‹Georgia Scenes,› a series of broadly humorous sketches, long popular (1840); ‹Letters From Georgia to Massachusetts.›

Longstreet, James, American soldier: b. in Edgefield district, S. C., 8 Jan. 1821; d. Gainesville, Ga., 2 Jan. 1904. He was graduated at the United States Military Academy in 1842; entered the army as lieutenant of infantry and, after performing duty at various Western posts, served in the Mexican War, in which (at Chapultepec) he was badly wounded and for gallantry in which he received the brevets of captain and major. From 1847 to 1852 he was stationed on the Texas frontier and in 1858 became paymaster with the rank of major. In June 1861, the Civil War having broken out, he resigned from the United States army and entered that of the Confederacy as a brigadier-general. At the first battle of Bull Run (q.v.) he commanded a brigade, and in 1862 was made a major-general. In the retreat before McClellan, during the Peninsular campaign (q.v.) he was in command of Gen. J. E. Johnston's rear guard, and contributed greatly to the safe withdrawal of the main army to Richmond. In the Seven Days' Battles (q.v.) he fought with credit to himself and his division, whose losses were very heavy; and at the second battle of Bull Run (q.v.) he displayed promptness, energy, and generalship to which the Confederate victory was largely attributed. He commanded the right wing at Antietam, and at the battle of Fredericksburg (q.v.) had command of the left, repulsing the desperate assault of Burnside's army. After Fredericksburg he was made lieutenant-general, and with that rank commanded one of the three corps of the Confederate army of invasion, known as the Army of Northern Virginia. At the battle of Gettysburg (q.v.) during the second and third days, he commanded the right wing, which sustained the chief burden of the conflict, furnishing the columns that made Pickett's charge. Transferred to the Army of Tennessee, Longstreet arrived on the field in time to save the day. at the battle of Chickamauga (q.v.). He next moved unsuccessfully against Burnside at Knoxville (q.v.) and early in 1864 rejoined General Lee in Virginia. Again distinguishing himself in the battles of the Wilderness, he was severely wounded and for some months disabled, but was in command of the First corps of the Army of Northern Virginia during the later months of 1864 and took some further part in active field-service, retaining to the last his distinction as a general and a fighter, and coming out of the war at its close with the respect of the whole country, which has never diminished. After the war he engaged in business in New Orleans and, having become a Republican in politics, was surveyor of customs at that port, 1869–73. In the same city he was afterward postmaster. He removed to Georgia in 1875; was United States minister to Turkey, 1880–1; in 1881–4 served as United States marshal of Georgia, and was appointed United States railway commissioner in 1898. He has written for periodicals, and has published ‹From Manassas to Appomattox› (1896).

Longstreet, William, American inventor: b. New Jersey 1760; d. Georgia 1814. He settled in Augusta, Ga., in early life and on 26 Sept. 1790 wrote a letter to Thomas Telfair of Savannah asking his assistance in raising the means to construct a boat to be propelled by steam. This letter was published in the Savannah and Augusta newspapers, but funds were not immediately obtained, though he stated his entire confidence in the success of the scheme. He was subsequently furnished with the necessary means for experiment, and constructed a small model boat, upon a plan very different from Fulton's, which went on the Savannah River against the stream at the rate of five miles an hour. Cotton had previously been ginned by two rollers, not quite one inch in diameter, which caught the fibres, pressed out the seed, and delivered the clean cotton on the other side, where it was taken by the ginner's hand, and deposited in a bag attached to his person. Longstreet invented and patented the «breast roller,» moved by horse power, which entirely superseded the old method. The inventor set up two of his gins in Augusta, which were propelled by steam, worked admirably, and promised him a fortune. They were, however, destroyed by fire within a week. He next erected a set of steam mills near St. Mary's, Ga., which were destroyed by the British in an invasion in the War of 1812. These disasters exhausted his resources and discouraged his enterprise, though he was confident that steam would soon supersede all other motive powers.

Longueuil, lŏṅ-gėl, Canada, town, in Chambly County, in the province of Quebec; on the Saint Lawrence River, and on the Canadian Pacific railroad. It is situated opposite Hochelaga, the northeastern part of Montreal. Longueuil is a residential suburb of Montreal, the country around contains many summer homes of city residents. It has Saint Anthony's orphanage and an academy for girls and one for boys. Pop. (1901) 2,835.

Longueville, Anne Geneviève de Bourbon Condé, ăn zhĕn-vē-ĕv dė boor-bôṅ kŏn-dā lŏṅg-vēl, Duchess of, French beauty and politician: b. Vincennes 29 Aug. 1619; d. Paris 15 April 1679. Her father, Henry II., prince of Condé, was prisoner in the chateau of Vincennes at the time of her birth. Her brothers were the great Condé and the Prince of Conti. The Prince de Joinville, to whom she had been betrothed, having died, she married in 1642 the Duke de Longueville, a widower double her age. Imbibing a fondness for politics, she displayed it most actively in the part which she took in the Fronde. In order to punish the duchess, her brothers and husband were arrested by order of Anne of Austria, the regent, in 1650; but she persisted in her resistance to the court, and repaired to the citadel of Stenay in Flanders, of which she took the command, and was able to induce Turenne to join the Fronde. After the peace of 1659 she devoted herself to a religious life and her influence in Rome was said to have secured for the Jansenists the so-called peace of Clement IX. (1668). The later part of her life was spent in the Carmelite convent of Paris in most stringent observance of religious duties. Cousin, in his ‹Madame de Longueville› (6th ed., 1859), calls her «the soul of the Fronde.»

Longus, lŏng'gŭs, Greek writer, supposed to have lived about the close of the 4th or the beginning of the 5th century A.D. Concerning his history nothing is known. He was the author of a pastoral romance entitled ‹The Pastorals of Daphnis and Chloe,› of which the best editions are those of Villoison (1778), Courier (1810), Passow (1811). Longus is the latest of the bucolic poets and in the Renaissance period was widely read, his pastoral descriptions, as given in Amyot's French translation, having not a little to do with the revival of the pastoral form.

Long'view, Texas, town, county-seat of Gregg County; on the Texas & P., the Texas, S. V. & N., and the Great N. R.R.'s; about 240 miles northeast of Austin and 120 miles east of Dallas. It is situated in an agricultural section, in which are raised large crops of grain and cotton. The chief manufacturing establishments are foundry, lumber-mills, railroad-shops, cottonseed-oil mills, and plow-works. The principal offices of the Texas, Sabine Valley & Northwestern railroad are in Longview. The trade is principally in agricultural products, live stock, hides, cottonseed-oil, and lumber. Pop. (1890) 2,034; (1900) 3,591.

Long'worth, Nicholas, American wine manufacturer and horticulturist: b. Newark, N. J., 16 Jan. 1782; d. 1863. At 21 he went to the then unimportant settlement of Cincinnati, where he studied law. After 25 years' experience at the bar he retired from professional life in order to devote himself to the cultivation of the grape, with a view of manufacturing wine. At first his efforts were unsuccessful from his having adopted the erroneous notion of the early American vine growers, that foreign plants were alone to be relied upon. He had imported many different species from every vine-growing country in Europe before trying those indigenous to the United States. About 1828 he commenced the experiment, and became a high authority in vine culture, being not infrequently called the «Father of American Grape Culture.»

Lönnrot, lėn'rŏt, Elias, Finnish philologist: b. Sammatti, in Nyland, 9 April 1802; d. there 19 March 1884. Recognizing the value of the people's songs and ballads for Finnish language study, he spent years in collecting such material in Finland, Lapland, and adjoining provinces, and published the fruits of his researches in a series of volumes. Among his «finds» is to be numbered the great popular epic ‹Kalevala,› of which only a few cantos were previously known to the learned world. He wrote a ‹Finnish-Swedish Dictionary› (1866-80). See Kalevala.

Loo (short for lanterloo, from the Dutch name), a game of cards played with five (sometimes three) cards, dealt from a whole pack, either by threes and twos, or one at a time. After dealing, a card is turned up for trumps. The jack of clubs, or the jack of the trump suit, as agreed on, is the highest card, styled «pam»; the ace of trumps is next, and then the other cards as in whist. Five cards of a suit, or four with «pam,» compose a «flush,» which sweeps the board, and yields only to a superior flush, or the elder hand. When the ace of trumps is led, it is usual to say, «Pam be civil»; the holder of the jack (of trumps or clubs; see above) is then expected to let the ace pass. Each player has the liberty of changing his cards for others from the pack, or of throwing up the hand, in order to escape being looed, that is, failure to gain a trick. All those that win tricks divide the pool or «loo,» to which on entering the game each player contributes chips (usually three) in proportion to the tricks taken. Every player who is looed must again contribute a stake, which, with the dealer's stake, forms a new pool.

Loo-choo Islands. See Liu-Kiu Islands.

Loo'fah, Egyptian, the fibrous portion of the fruit of one or two species of the genus *Luffa* of the gourd family, sold for use as a bath-sponge or flesh-rubber. There are about 10 species of the genus known, but the «towel gourd,» as this bath-sponge is sometimes called, appears to be obtained chiefly from *L. ægyptiaca.* In the West Indies the fruit of *L. acutangula* yields a similar network of fibres, and is there used as a sponge or dishcloth, and worked up into baskets and small ornamental articles.

Looking Backward, 2000-1887, a romance by Edward Bellamy, published in 1888. It had a sale of nearly 400,000 copies in the next ten years, and is still in demand. It recounts the strange experiences of Julian West, born in 1857, who in 1887 is put into a hypnotic sleep. In the year 2000, Dr. Leete, a retired physician, is conducting excavations in his garden, when West's subterranean chamber is disclosed. The doctor discovers and resuscitates the young man, who finds himself in a regenerated world.

Lookout Mountain. See Chattanooga, Battle of.

Loom, a term originally meaning simply «tool,» but now particularized so as to apply to a machine for weaving. The simplest form of the loom, still in use among semi-primitive tribes and up to the middle of the 18th century practically the only form, was the hand loom, a rectangular frame, from one side of which yarn is stretched to the opposite side, where it is so secured that the transverse threads may be passed by hand «over and under» the threads already stretched. Fig. 1

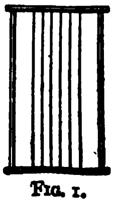


Fig. 1.

shows the simplest form of this loom. The form in commoner use in civilization up to Cartwright's invention of the power loom in 1785 is merely this same actual frame set in a skeleton box (AAAA) in a horizontal position (Fig. 2). The end pieces of the actual frame are now rollers, so that the length of the piece of cloth is no longer necessarily less than the length of the frame. These rollers are the beam or yarn-roll (B), which is at the back of the loom, and upon which the warp threads are wound, and the cloth beam (C) to which the threads are fastened and which winds up the cloth as it is made. The threads of the warp, held tight by weights (b, b), pass through the eyes of the heddles (or healds), thus being separated to permit of the passage of the shuttle, and also through the reed. The shuttle in the hand-loom is thrown by the operator, and in the power loom by the picker-staff machinery; in either case it is made of hard wood, is pointed at either end and carries in a recess the quill or bobbin.

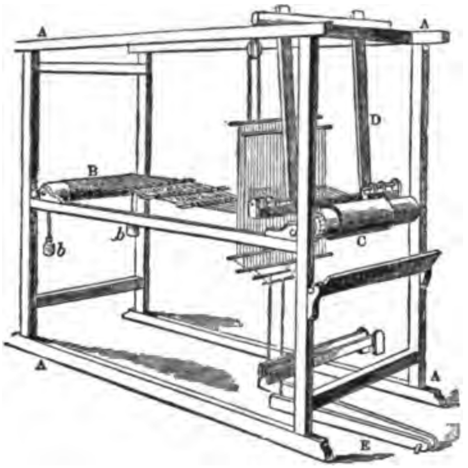


Fig. 2.

This hand-loom was first successfully improved, after the unfortunate attempts of De Gennes in 1678, by Edmund Cartwright, who undertook in 1785 to counterfeit by mechanical means the three simple motions of weaving. He had neither mechanical nor textile training, but his loom though cumbrous and awkward is essentially that now in use. The simplest modern loom differs essentially from the hand loom in that the warp yarn is no longer stretched direct from the yarn roll to the cloth beam, and these two parts are no longer placed at the same height from the base of the frame nor at so great a distance as before. The yarn runs upward from the warp-beam over the whip-roll, thence is carried through heald, heddle, or (the American term) harness, and through the reed, and down from the latter to the cloth roll. The advantage of this arrangement is greater stability and a distinct saving in space, the depth of the loom being materially decreased. With the old fashioned heddle only the simplest and most regular webs could be woven; for figured patterns the most effective mechanism is the Jacquard attachment, patented by a weaver of Lyons, Joseph Marie Jacquard, in 1801. This machine lends itself readily to use with any loom. It may be described as a means of forming the shed and governing the heddle,— in fine, it takes the place of the weaver's fingers. A revolving drum or cylinder is so perforated as to catch some or all needles, which in turn govern a set of perpendicular hooks. These hooks guide the threads of the warp, so that the weaving is no longer of necessity simply «under or over.» How many threads are to be skipped is determined by a perforated card-board, the perforations occurring where the thread of the warp is to lie above the filling; but if the warp-threads are not to be raised no holes are cut in the cards, the needles do not enter the cylinder, and the hook attached to the needle does not lift, by means of its neck-cord or loop of twine, the thread of the warp. A series of these cards, each with different perforations, makes an almost infinite combination of patterns possible, as each card makes a different shed.

The hand loom is still used for the manufacture of rugs and fine carpets, but the power loom, driven by various powers, electricity being the latest and in some ways the most economical, is used for almost any purpose. The ribbon-loom, for instance, weaves simultaneously a number of narrow pieces. Many attachments, invented in a long series, have continuously and wonderfully decreased the need of any supervision of the loom, making it more and more automatic: thus a shuttle protector automatically stops the machinery if the shuttle fails to fly all the way across the warp; the filling stop motion protects the machinery from running on uselessly when the filling breaks or runs out; and take-up, let-off, and warp-stop motions are further automatic devices. The highest pitch of automatic attachment is the Northrop patent, which is a hopper full of loaded bobbins; these are fed into the place of the empty bobbins as soon as the yarn is exhausted.

See Posselt, ‹Textile Machinery› (1901) and ‹Jacquard Machine Analyzed and Explained› (1893); and Barlow, ‹History and Principles of Weaving by Hand and by Power› (1879).

Loo'mis, Alfred Lebbeus, American physician: b. Bennington, Vt., in 1833; d. 23 Jan. 1895. He was graduated at Union College in 1851, and studied medicine in New York city at the College of Physicians and Surgeons, where he was graduated in 1852. He gave his attention to diseases of the lungs at a time when auscultation and percussion were acquiring great scientific importance in medical practice, and in the treatment of such diseases became an efficient specialist. In 1859 he was appointed visiting physician to Bellevue Hospital, New York, and was made lecturer on physical diagnosis at the College of Physicians and Surgeons in 1862. Having spent some months in the Adirondack Mountains for the improvement of his health, in later years he established the Sanitarium at Saranac and the Hospital for Consumptives at Liberty, N. Y. In 1866 he accepted the professorship of theory and practice of medicine at the University of the City of New York, remaining in connection with that institution until his death. The work done by him for its medical department was of great and lasting importance, as were also the services he rendered to the New York Academy of Medicine. In 1874 he was appointed visiting physician to Mount Sinai Hospital: was president of the New York Academy of Medicine, 1899–90 and 1891–2. His publications include ‹Lessons in Physical Diagnosis› (1870); ‹Lectures on Fevers› (1877); and ‹A Text-book of Practical Medicine› (1884). He also edited ‹An American System of Medicine› (1894).

Loomis, Charles Battell, American humorist: b. Brooklyn, N. Y., 16 Sept. 1861. He was educated at the Brooklyn Polytechnic Institute and held a business clerkship 1879-91. He is a frequent contributor to periodicals and has published ‹Just Rhymes› (1899); ‹The Four-Masted Cat-boat› (1899); ‹Yankee Enchantments› (1900); ‹A Partnership in ‹Magic› (1903).

Loomis, Chester, American painter: b. near Syracuse, N. Y., 18 Oct. 1852. He was educated at Cornell University (1868-71); studied painting at Paris under Léon Bonnat, and after a residence of 11 years in France opened a studio at Englewood, N. J. He is favorably known as a figure and landscape painter and his pictures are found in many private collections. His ‹Christopher Sly› was awarded a gold medal at the Massachusetts Charitable and Mechanics' Institution Exhibition and was subsequently purchased by the Indianapolis Art Association.

Loomis, Elias, American physicist: b. Willington, Conn., 7 Aug. 1811; d. New Haven, Conn., 15 Aug. 1899. He was graduated at Yale College in 1830, and was tutor there in 1833-6. He was the first person in America to obtain a view of Halley's comet, at its return in August 1835, and his observations on that body, with a computation of its orbit, were published in the ‹American Journal of Science.› After a year's study in Paris he was professor (1837-44) of mathematics in Western Reserve College, Ohio, of natural philosophy (1844-60) in the University of New York, and of natural philosophy and astronomy (from 1860) at Yale. He devoted much of his time to original research, wrote more than 100 scientific treatises, and published a series of text-books on mathematics, natural philosophy, astronomy, and meteorology, of which more than 500,000 copies were sold. Among his publications were: ‹Elements of Algebra›; ‹Elements of Geometry and Conic Sections›; ‹Recent Progress in Astronomy.›

Loomis, Francis B., American journalist and diplomatist: b. Marietta, Ohio, 27 July 1861. He was a graduate from Marietta College, and in 1883 joined the staff of the New York *Tribune.* He was state librarian of Ohio 1885-7; consul at St. Etienne, France, 1890-3, and editor-in-chief of the Cincinnati *Daily Tribune* 1893-6. He was United States envoy-extraordinary and minister plenipotentiary to Venezuela, 1897-1901, and while there was active in promoting the interests of American commerce in South America. He filled the same diplomatic position at the court of Portugal 1901-03, and became assistant secretary of state in January 1903.

Loomis, Gustavus, American soldier: b. Thetford, Vt., 1789; d. 1872. He was graduated at West Point and received his commission as sub-lieutenant of artillery in 1811. He saw service on the Niagara frontier from 1812 to 1813, in which latter year he took part in the capture of Fort George (May 27) and was made prisoner the following December at Fort Niagara. During the war with Great Britain, the Black Hawk war, and the campaign against the Seminole Indians, he held important commands, and after the Civil War, in which he served as superintendent of the general recruiting service, was retired with rank as colonel of infantry. In 1865 he received the brevet of brigadier-general of the United States army.

Loomis, Lafayette Charles, American author and educator: b. North Coventry, Conn., 7 July 1824. He was graduated from Wesleyan University, Conn., in 1844, and was successively president of colleges at Wilmington, Del., and Wheeling, W. Va., and later medical professor at Howard University, Washington, D. C. He has published ‹Mizpah› (1859); ‹Mental and Social Culture› (1868); ‹Index Guide to Travel and Art Culture in Europe› (1880); ‹Myself› (1894).

Loomis, Silas Lawrence, American scientist and inventor: b. Coventry, Conn., 1822. He was graduated from Wesleyan University in 1844, from the medical school of Georgetown University in 1856, and was professor of physiology at Georgetown in 1859-60. In 1857 he was appointed astronomer to the United States coast survey, in 1860 instructor in mathematics to naval cadets, in 1861-7 was professor of chemistry and toxicology at Georgetown, and subsequetly occupied a chair at Harvard. Among his inventions are a process for manufacturing a textile fabric from the palmetto, and another for making profitable use of chromium ores. He wrote text-books of arithmetic, a ‹Key to the Normal Course› (1867), and other works.

Loon, lō-ōn', Philippines, a pueblo of the province of Bohol, situated on the west coast, 13 miles north of Tagbiliran, and opposite Dalaguete, Cebu. A mole 328 yards long, protecting the harbor, extends to the town, which is reached by steps cut in the rock. It is picturesquely situated on the slope of the Cammanoc hills, and has on old Spanish fort with bastions. It is centrally located for trade, and is the largest town in the province. Pop. 15,400.

Loon. See DIVER.

Loos, lōs, **Charles Louis,** American educator: b. Woerth-sur-Sauer, Basse-Alsace, France, 23 Dec. 1823. He came to the United States in 1832, and settled at New Franklin, Ohio, where he studied English, became connected with the Disciples of Christ in 1858 and preached at 17. He was graduated from Bethany College in 1846, where he was professor of ancient languages 1858-80. He was president of Kentucky University 1880-97. In 1849 he was ordained to the ministry of the Disciples and has been of great prominence in his denomination.

Loose'strife, a plant of the genus *Lysimachia,* of the primrose family, about 40 species of which grow in the temperate zone. Several yellow-flowered species belong to the United States, but those best known are the whorled or four-leaved (*L. quadrifolia*), and the bulb-bearing, *L. terrestris.* Two or three species, especially *L. nummularia,* popularly known as moneywort, creeping Charley and creeping Jenny, have been introduced from Europe. One kind is eaten in India as a pot-herb with fish. «Again and again,» says Miss Lounsberry, in her ‹Southern Wild Flowers and Trees,› «we come across the loosestrifes during our summer and early autumn rambles. And soon we learn to associate with them their opposite, or whorled, leaves, always entire, and their upright, rather stiff manner of growth, and very frequently we look for their petals to be darkly spotted near the bases. In personality the genus reminds us somewhat of the St. John's-wort, but we think of the latter as being usually freer, more prolific bloomers. The old and pretty legend concerning our present plants is that they loose strife; that they act as peace-makers especially among cattle that are quarrelsome. Believing this, people in the old country used to tie such a spray to their yokes before starting out on a long journey."

The name loosestrife is also given to species of the genus *Lythrum,* which some botanists place in the order *Primulaceæ,* of which about a dozen species are widely distributed in temperate climates. They are characterized by four-angled stems, usually opposite leaves which are sometimes whorled, and reddish-purple or white flowers, solitary above and whorled lower down the stems. Some are cultivated for ornament in borders and among shrubbery, where they succeed well. The best-known species is the purple loosestrife (*L. silicaria*), which is frequently planted.

Lope de Vega, lō pā dā vā'gä. See Vega, Carpio.

Lopes, lō'pāsh, **Caetano,** Brazilian historian: b. Bahia October 1780; d. Paris 22 Dec. 1860. He was a mulatto and after obtaining an education in Bahia and Paris, France, settled in the latter place in 1822 and became corresponding member of the Academy of Inscriptions and Belles-lettres. The Emperor Pedro held him in high esteem and the Historical Institute of Rio Janeiro bestowed him its gold medal. He was conspicuous for brightness of style and purity of language. His works, which are numerous, treat of history, biography, and surgery.

Lopes, or **Lopez, Fernao,** Portuguese chronicler: b. about 1380; d. after 1459. He was appointed chief archivist of the kingdom by Dom Joao I. in 1434, and spent his life in historical research and the composition of chronicles, which for literary and critical value were unsurpassed in his century. His 'Chronicle of Señor Don John I.,' describing the great struggle between Portugal and Castile, invites comparison with Froissart's chronicle on account of its picturesqueness and dramatic reality. Equally vigorous are his chronicles of Dom Pedro I. and Don Fernando.

Lopez, lō'pāz or lō'pāth, **Carlos Antonio,** President of Paraguay: b. near Asuncion about 1795; d. there 19 Sept. 1862. He was educated in Asuncion and became noted for his legal acquirements. After the death of President Francia, in 1840, he was secretary of the junta which controlled Paraguay for a few years. In March 1844 the Paraguay congress adopted the constitution he had drawn up and elected him president of Paraguay for ten years. He was reelected for three years in 1851; and again in 1857 for seven. He followed Francia's policy in the main and became involved in quarrels with foreign nations. In 1859 the United States sent a naval force to the Plata to enforce demands against him. He offered to submit the question of damages to arbitration, but afterward evaded the claim.

Lopez, Francisco Solano, Paraguayan president: b. Asuncion 24 July 1827; d. near the Aquidaban 1 March 1870. He was the son of Carlos Antonio Lopez (q.v.), then president. In his 18th year his father made him a brigadier-general in the war against Rosas, the dictator of Buenos Ayres. He afterward filled some of the principal offices of state, and was sent to Europe in 1853, accredited to the chief courts there. In 1855 he returned to Paraguay, became minister of war, and on the death of his father, in 1862, president for ten years. He had aimed at the foundation of a great inland empire, and as his military preparations were now complete, and his army superior to that of any of the South American states, he began hostilities against Brazil in 1864. The Argentine Republic and Uruguay allied themselves with Brazil, and after five years' conflict Lopez was reduced to extremities, and was finally surprised on the banks of the Aquidaban by a troop of Brazilian cavalry and slain. The latter part of his career had been stained by many cruelties and wanton murders. Consult: Thompson, 'The War in Paraguay' (1869); Masterman, 'Seven Eventful Years in Paraguay' (1869); Burton, 'Letters from the Battle Fields of Paraguay' (1871); Washburn, 'History of Paraguay' (1871); Schneider, 'Der Krieg der Triple-Allianz' (1872–5).

Lopez, José Hilario, hō-sā' hē-lä'rē-ō, Colombian politician: b. Popayan 18 Feb. 1798; d. Neiva 27 Nov. 1869. He was president of New Granada (Colombia) from 7 March 1849 to 7 March 1852, and in the last named year slavery was abolished and changes were made looking to the formation of a federal government. In the revolutions of 1854 and 1859–62, he fought with the Federalists and was commander-in-chief for part of this period. He was a member of the provisional government 1862–3, and subsequently President of Tolima. In 1867 he was named commander-in-chief of the army.

Lopez, Narciso, Cuban revolutionist: b. Venezuela 1799; d. Havana, Cuba, 1 Sept. 1851. He served for some time in the Spanish army, from which he retired in 1822 with the rank of colonel. After the evacuation of Venezuela by the Spanish troops, he established himself in Cuba, and afterward during a stay at Madrid joined the party of Isabella against Don Carlos, and became successively adjutant of Valdes, governor of the Spanish capital, and senator for Seville, but threw up his offices after the refusal of the Cortes to admit the representatives of Cuba. Valdes became governor-general of that island, and Lopez on returning thither was employed by him in various capacities. He was soon absorbed by the project of throwing off the yoke of Spain, and he proceeded in 1849 to the United States, where he sunk almost his whole fortune in the organization of three successive expeditions to Cuba: the so-called Round Island expedition in 1849; the "invasion of Cardenas" expedition in May 1850, both of which failed, and the Bahia-Honda expedition, of August 1851, which ended fatally. Lopez, with several hundred persons of different nationalities whom he had enlisted in various parts of the United States, landed at Morillo, near Havana, where he left 200 of his men under the command of Colonel Crittenden, who were taken by the

Spaniards and shot. Lopez went to Las Pozas, where he succeeded in repelling an attack of the Spanish soldiers; but, isolated from his friends, sought refuge in the mountains, where he was captured and taken to Havana. He was sentenced to death, which he met with great firmness.

Lopez, Vicente Fidel, Argentine historian: b. Buenos Ayres 1814. He is a son of Vicente Lopez y Planes (q.v.). He became rector of the University of Buenos Ayres and has published ‘Razas del Perú anteriores a la Conquista’; ‘Historia de la Republica Argentina’; ‘Tratado de Derecho Romano’; etc.

Lopez, Cape. See Cape Lopez.

Lopez de Ayala, Pedro, pä'drō, Spanish **ardo,** Spanish dramatist: b. Seville district 1 May 1828; d. Madrid 30 Jan. 1879. He was educated at the University of Seville, and at Madrid in 1851 had his first drama, ‘El Hombre de Estado,’ produced. In 1857 he was elected deputy from Badajoz to the Cortes, and subsequently he was a member of Alfonso XII.'s first cabinet. He was the author of numerous lyrics which take excellent rank in Spanish literature, especially of the ‘Epistola.’ But he was better known as a dramatist of high literary and popular success. Chief of his plays are ‘Tanto por Ciento’ (So Much per Cent), which was recognized by the bestowal upon him of a gold crown, and ‘Consuelo.’ Both are searching arraignments of the principles of modern life.

Lopez de Ayala, Pedro, pä'drō, Spanish poet: b. Murcia 1332; d. Calahorra 1407. He served well Henry II., John I., and Henry III., kings of Castile, attained the highest dignities, including those of lord chancellor and high chamberlain of Castile, and wrote the ‘Cronicas de los Reyes de Castilla’ (‘Chronicles of the Kings of Castile’) (1780), which covers the period from King Peter to Henry III. In this work he strove to substitute for the dry record of the historiographers a pragmatic account of historical events. He also wrote lyrics, and the ‘Rimado de Palacio’ (‘Rime of the Palace’), a satiric poem on political and social questions.

Lopez y Planes, lō'pāz or lō'pāth ē plä'nĕs, **Vicente,** Argentine poet: b. Buenos Ayres 1784; d. there 1856. He was prominent as a soldier and politician, was member of Congress, 1819–25, and provisional president of the republic, 5 July to 13 Aug. 1827. He presided over the supreme court of justice, and was governor of the province of Buenos Ayres. He was the author of the ‘Argentine National Hymn’ and other poems.

Lophi'odon, an extinct tapir-like animal, found in the Eocene fresh-water deposits of central Europe. The genus is typical of a family (*Lophisdontidæ*) which includes also the genera *Hyracotherium, Hyrachus, Systemodon* and *Orohippus*, and is a very generalized group probably ancestral to the rhinoceroses. Consult Woodward, ‘Vertebrate Paleontology’ (1898).

Lophobranchii, lō-fō-brang'kĭ-ī, a suborder of bony fishes, including the «sea-horses» and «pipe-fishes» (*Syngnathidæ*). See Ichthyology.

Loquat lō'kwat, or **Japan Plum,** a shrub or small tree (*Eriobotrya japonica*) of the natural order *Rosaceæ*. It attains heights of about 20 feet, bears thick evergreen leaves near the ends of the branches, and fragrant, woolly, whitish flowers in terminal panicles in late summer and autumn, followed by downy yellow oval or pyriform fruits (pomes) which ripen in very early spring. The fruits, which in favorable climates are borne in profusion, are highly esteemed for their sub-acid flesh and their pleasantly flavored seeds, the former being used as a dessert, the latter for flavoring cookery. The tree is a native of Japan and China, whence it has been taken to subtropical climates throughout the world. In the Gulf States and in California it is widely popular as a home fruit, though it appears in northern markets. In California several highly improved varieties were produced during the closing decade of the last century. In the north it is often grown in conservatories.

Lorain, lō-rān', Ohio, city, in Lorain County; on the south shore of Lake Erie, at the mouth of the Black River, and on the New York C. & St. L. (Nickel Plate), Baltimore & O., and Lake Erie & Pittsburg R.R.'s; about 26 miles west of Cleveland. The first permanent settlement was made in 1822 by Barney Meeker. It was incorporated as a village in 1873 and as a city in 1895. It is an agricultural and natural-gas region, and is a shipping port for farm products, for the output of the Central Ohio coal fields, and for the lumber and iron ore of a large section of the State. The chief industries of the city are ship-building, coal shipping, manufacturing steel, general manufacturing, and fishing. The Lorain Steel Company employ about 4,000 people; the American Shipbuilding Company, 1,300; the Baltimore & Ohio, in shops, at docks, etc., 1,000; small industries, about 2,000. The city has excellent public and parish schools, a public library, 22 churches, and Saint Joseph's Hospital. There are five banks with a combined capital of $300,000. The annual amount of business is about $2,500,000. About 75 per cent. of the inhabitants are American born. The government is vested in a mayor, a board of public service (three members), and a council of seven members. Four of the council are elected one from each ward, and the other three, at large. The board of education, waterworks trustees, and marshal are chosen by popular election; the board of health are chosen by the council; the police are appointed by the mayor subject to approval by the council. The waterworks are owned and operated by the city. Pop. (1890) 4,863; (1900) 16,028.

F. A. Rowley,
Editor of ‘Times Herald.’

Lorca, lŏr'kä, Spain, city, in the province of Murcia; on the Sangonera River; about 20 miles north of Aguilas, the Mediterranean port. It is an ancient city, established before the Moors came to Spain, as is evidenced by the older houses; but the main part of the city now existing is of Moorish construction. It has considerable manufacturing interests, and in the vicinity are valuable mines of silver, sulphur, and lead. The farms in the surrounding country have to be irrigated in the dry seasons, and for the storage of water of the Sangonera a dam, 800 feet long and 160 feet high, was built near the city. In 1802 the dam burst, and the valley was flooded. Many lives and much property were lost. Lorca was the scene of many battles between the Christians and the Moors. Pop. 70,127.

Lord (Anglo-Saxon «hlâford,» for «hlâf-weard,» bread-keeper), English title of honor or dignity, used in different senses. In feudal times the lord was the grantor or proprietor of the land, who retained the ultimate property in it, the use only being granted to the tenant. Between the superior lord, or lord paramount, and the actual tenant, stands the lord of the manor or mesne lord. Lord is also a mere title of dignity, attached to certain official stations, which are sometimes hereditary, but sometimes only official or personal, as lord advocate, or lord mayor, a title applied to the chief magistrates of London, York, and Dublin. See also LORD CHAMBERLAIN and LORD LIEUTENANT. In its most definite sense in English it is equivalent to peer, but does not express any special rank or degree of nobility. The five orders of nobility constitute the «lords temporal,» in contradistinction to the prelates of the church, or «lords spiritual,» that is, such archbishops and bishops as are members of the legislature and sit in the House of Lords. The title is also applied, but only by courtesy, to the sons of dukes and marquises, and to the eldest sons of earls.

Lord, Chester Sanders, American journalist: b. Romulus, N. Y., 18 March 1850. He studied at Hamilton College, but was not graduated. He was for a time associate editor of the *Oswego* (N. Y.) *Advertiser*, and in 1872 became one of the staff of the New York *Sun*, of which he is managing editor. He was elected a regent of the University of the State of New York in 1897.

Lord, Edwin Chesley Estes, American geologist and chemist: b. Brooklyn, N. Y., 7 May 1868. He was educated in Brunswick and Heidelberg, Germany, and was assistant professor of mineralogy and petrography in Harvard from 1888 to 1901. In November 1901 he was appointed assistant in petrography and chemistry in the United States Department of Agriculture. He has published ‹Dissertation on Basalts of the Fichtelgebirge, Bavaria› (Heidelberg), and numerous papers in the bulletins of the U. S. Geological Survey and the U. S. Department of Agriculture, and in periodicals.

Lord, Eleanor Louisa, American educator: b. Salem, Mass., 27 July 1866. She studied in Smith College and in Bryn Mawr College, in America, and in Newnham College, Cambridge, England; and was fellow in history in Bryn Mawr, 1889–95. She taught in the Malden, Mass., High School, 1887–9; in Smith College, 1890–4; and in the Woman's College, Baltimore, after 1897. She has published ‹Industrial Experiments in the British Colonies of North America› (1898).

Lord, James Brown, American architect: b. New York 26 April 1859; d. there 1 June 1902. He was graduated from Princeton in 1879 and after studying architecture practised his profession in his native city, where he designed the Appellate Court in Madison Square, the first of the Carnegie branch libraries, and 16 of the other 65. He was chosen as architect of the Memorial Building erected by the class of 1879 of Princeton.

Lord, John, American historian and lecturer: b. Portsmouth, N. H., 10 Sept. 1812; d. Stamford, Conn., 15 Dec. 1894. He was graduated from Dartmouth in 1833; studied theology for a time at Andover Theological Seminary, and though not ordained to the ministry occupied Congregational pulpits in New Marlboro and Stockbridge, Mass. After 1840 he devoted himself to literary work, and lecturing. In 1843–6 he was in England, giving lectures on the Middle Ages, and on his return to the United States continued to lecture for many years in the principal towns and cities, giving over 6,000 lectures in all. From 1866–76 he was lecturer on history at Dartmouth College. His lectures were published under the title ‹Beacon Lights of History› (1883): he also wrote: ‹Modern History for Schools› (1850); ‹The Old Roman World› (1867); and ‹Ancient States and Empires› (1869).

Lord, John King, American educator: b. Cincinnati, O., 21 Oct. 1848. He was graduated at Dartmouth College in 1868. In 1869 he was made a tutor in Latin in Dartmouth; professor of Latin and rhetoric, 1872–80; professor of oratory and belles lettres, 1880–2; associate professor, 1882–92, and after 1892 professor of the Latin language and literature. He has edited many Latin text books and Chase's ‹History of Dartmouth College› (1891), is the author of an ‹Atlas of the Geography and History of the Ancient World› (1902), and has translated Hertzburg's ‹Geschichte der Römer im Alterthum› (1902).

Lord, Nathaniel Wright, American chemist and mineralogist: b. Cincinnati, O., 26 Dec. 1854. He was graduated at the Columbia School of Mines in 1876. Since 1883 he has been chemist for the Ohio Geological Survey and the Ohio State Department of Agriculture, and since 1888 professor of metallurgy and mineralogy in Ohio State University. He is the author of ‹Notes on Metallurgical Analysis,› and of numerous papers on scientific subjects.

Lord, William Frewen, English historical writer: b. Brighton, Sussex, 23 Feb 1861. He was educated at Trinity College, Cambridge, was attached to the Bombay civil service 1881–9, and has been lecturer on and professor of modern history at the Durham College of Science, Newcastle-on-Tyne, from 1899. He has published: ‹The Lost Possessions of England› (1895); ‹Lost Empires of the Modern World›; ‹Life of Sir Thomas Maitland› (1897); ‹Development of Political Parties under Queen Anne› (1900); ‹England and France in the Mediterranean› (1901).

Lord, William Paine, American soldier and diplomatist: b. Dover, Del., 1838. He was graduated at Fairfield College, N. Y., in 1860, and at the Albany Law School in 1866. In the Civil War he served as major of Delaware cavalry, and as judge-advocate on the staff of General Lew Wallace. After the war he was given a lieutenancy in the regular army, and served at Forts Alcatraz and Steilacoom and in Alaska, resigning in 1868. Since then he has practised law at Salem, Ore., was a State senator in 1878, and for 14 years sat on the Supreme bench of the State. He became governor of Oregon in 1895, and at the expiration of his term in 1899 was appointed United States minister to Argentina. This position he still (1903) continues to hold.

Lord Chamberlain, an officer in England who has control of the establishment attached to the chapels royal; of officers and servants attached to the royal chambers, except of those of the bedchamber; and over the medical men of the household. He appoints royal tradesmen, directs all great royal ceremonies, receives all applications to attend levées and drawing-rooms, superintends the royal wardrobe and the jewel house at the Tower, and licenses theatres and plays, his power extending to the cities of London and Westminster, and certain other parts of the metropolis, as well as to those places within which the sovereign may reside occasionally.

Lord Howe Islands, a group of small islands in the Pacific Ocean; nearly 500 miles east of Australia. They are of volcanic origin; and are nearly 3,000 feet above the sea. The group was discovered in 1788 by Lieutenant Ball, but was not colonized until 1840, when New South Wales was given charge of the government. In the surrounding waters there is an abundance of fish. The flora is beautiful and varied, banyan trees are conspicuous.

Lord Lieutenant, a British official of high rank, representing the sovereign, as: (1) The Viceroy, or Lord-lieutenant of Ireland, who is a member of the ministry, and retires from office on the resignation of the Cabinet. His power is quasi-regal; thus he can confer knighthood. In his government he is assisted by a privy council nominated by the sovereign. (2) The lord-lieutenant of a county, the principal official of a county, at whose nomination all deputy-lieutenants and justices of the peace are appointed, and first commissions in the yeomanry, militia, and volunteers are given.

Lord-Mayor's Day, the 9th of November, on which a great procession accompanying the newly elected Lord Mayor of London from Westminster to Guildhall takes place. The procession, formerly famous for its historical and allegorical devices, notably the huge wooden effigies called Gog and Magog, has now much dwindled.

Lord of the Isles, a title borne by chiefs who ruled the western islands of Scotland. They were descended from Somerled, the Lord of Argyll, on whom David I. conferred the islands of Arran and Bute after he had driven the Norwegians out. John, fourth and last Lord of the Isles, was deprived of his title and estates by the Parliament of May 1493. In 1540 the Lordship of the Isles was annexed to the Scottish crown, and from it the Prince of Wales derives one of his titles.

Lord Ormont and His Aminta, a novel, by George Meredith, published in 1894. In this tale the author's enigmatical laughter sounds louder than usual; possessing at the same time a quality which leaves the reader in doubt whether the mirth is at his expense or at the expense of the characters.

Lord's Day. See SABBATH.

Lords, House of. See PARLIAMENT.

Lord's Prayer, The, sometimes called «Our Father» or the «Pater Noster,» from the first two words in English or in Latin; and called the «Lord's Prayer» because taught by our Lord to his disciples. The prayer is given in the Bible, in Saint Matthew vi., and in Saint Luke xi. The prayer is given as a model, and in Matthew is introduced by the words: «After this manner therefore pray ye.» In Luke the introduction is: «When ye pray say,» and is followed by the words. There is a difference in the form as given in the two gospels mentioned. In Matthew the words are: «Our Father who art in heaven, hallowed be thy name; thy kingdom come; thy will be done as in heaven so upon earth. Give us to-day our daily bread; and forgive us our debts, as we also have forgiven our debtors; and lead us not into temptation; but deliver us from evil. Amen.» In Luke the words are: «Father, hallowed be thy name; thy kingdom come. Give us day by day our daily bread; and forgive us our sins; for we also forgive everyone indebted to us; and lead us not into temptation.»

The doxology, «For thine is the kingdom, and the power, and the glory for ever, Amen,» is not found in many of the best ancient authorities, and for that reason it is omitted in Tischendorf's eighth edition of the New Testament and in the Westcott and Hort Greek New Testament.

The prayer was introduced or taught in the «Sermon on the Mount,» and as given in Matthew, consists of nine parts — one salutation or invocation, seven petitions, and «Amen.» In the salutation there are three distinct points; first, the word «Father,» implying fatherhood, sonship, children of. Second, the word «Our,» which includes all mankind, a profession of brotherhood, a manifestation of charity in the most effective manner. Third, «Heaven,» where God is in His glory, for where His glory is revealed that is heaven. The seven petitions are usualy divided into three parts. The first three petitions refer to the honor of God; the last three to our own advantage; and the fourth petition has an element of both the first and the last groups. The first petition is, «Hallowed be thy name,» because by the name of a thing we express the object itself. «Hallowed be,» or as expressed by the Greek, «Sanctified be,» thy name among men — thy external glory throughout the whole world. The second petition is, «Thy kingdom come,» — internally and externally without any limitations. The third petition is, «Thy will be done as in heaven so upon earth,» which relates to free co-operation of our wills with the will of God; that obedience here will be as perfect as in heaven, that perfect peace may reign on earth. The fourth petition is, «Give us to-day our daily bread.» Various authorities differ as to the exact meaning of the word qualifying bread, some holding that it makes the word bread mean spiritual food alone, others, bodily food, necessary food for the body; others that it implies food for both soul and body. The fifth petition is, «And forgive us our debts (trespasses) as we also have forgiven our debtors (those who have trespassed against us). The petitions preceding related to something good to be obtained; the fifth petition relates to deliverance from evils. The word translated «debts» or «trespasses» is translated «sins» in the gospel of Luke. This petition asks that both the forgiveness and the perfection of the forgiveness on the part of God will correspond to our forgiveness of our enemies. The sixth petition is, «And lead us not into temptation.» The seventh petition is, «But deliver us from evil.» The word «but» in this place, confirms what has been said and forms the transition to what follows. Differences of opinion have existed as to the meaning of the word «evil,» some authorities regarding it as meaning the «evil one,» others as moral evil, anything that hinders spiritual progress. The fifth petition relates to freedom from sin, the sixth to deliverance from sin, the seventh to warding off all spiritual dangers. The «Amen» is a common ending to prayer, usually derived from the Hebrew verb meaning «to be firm,» or from a Hebrew noun meaning «truth,» and commonly rendered «so be it» or «may it be so.» In this place its signification is usually regarded as meaning a stronger confirmation of what has just been said. In places in the liturgy of the Roman Catholic, the Protestant Episcopal, and the Greek churches where the word «Amen» occurs, it is usually said by the server or clerk; but the «Amen» belonging to the «Lord's Prayer» is said by the celebrant of the mass.

Some of the early writers divided the petitions into six, thus joining the sixth and seventh. Many Protestant writers make this division, but Roman Catholic writers follow Saint Augustine, and divide the prayer into seven petitions. Lutheran writers generally follow this division, also the Protestant writers, Bleck, Hilgenfield, Keil, and Tholuck. The gradation of the petitions is remarkable: First, the honor and glory of God is sought; second, our own greatest good; third, the necessary means to attain eternal life; fourth, necessities for the present life; fifth, to be freed from the greatest evil; sixth, to be freed from the evil next to the greatest; seventh, to be freed from all evil. The fifth, sixth, and seventh petitions are directed against the respective impediments opposed to the good mentioned in the second, third, and fourth petitions.

The doxology is explained in various ways; as a liturgical addition, as an ancient continuation used by the priests and then the people. The «kingdom» in the doxology seems to refer to the first and second petitions; the «power» to the third petition; and the «glory» to the following petitions.

Directly following the «Lord's Prayer,» in the gospel of Saint Matthew vi. 14, there is an extension or explanation of the fifth petition, giving again the conditions of forgiveness; «For if ye forgive men their trespasses, your heavenly Father will also forgive you.»

Commentators differ as to the exact relation between the form of the «Lord's Prayer» in the gospel of Matthew and in Luke. It is held by many authorities that the prayer was taught on two different occasions, to different persons, except the apostles who were present on both occasions. Both forms were given as models, and both contain the essentials. The prayer occurs in all ancient liturgies except the so-called Clementine liturgy — given in the Apostolic Constitutions. In all the principal liturgies it occurs shortly before Communion.

Many polyglot collections of the prayer have been published from the 16th century downward, the most remarkable of which were those of John Chamberlayne in 150 languages (1715), of Conrad Gesner in 200 (1748), and that of Padre Hervaz in 307 (1787). There are expositions of the Lord's Prayer by Origen, Chrysostom, Gregory Nyssa, Cyprian, Luther, Leighton, and Tholuck.

Bibliography.— Maas, 'The Gospel According to Saint Matthew'; Kenrick, the gospels of Saints Matthew and Luke in 'The Four Gospels'; Saint Thomas Aquinas, 'The Lord's Prayer'; and the following authors in various writings, Bleck, Meyer, Kiel, Schanz, Spirago, Tholuck, W. Grimm, Hilgenfield, Peischel, Saint Augustine, and Saint Alphonsus.

Lords Spiritual, in Great Britain, archbishops and bishops of the Anglican Church, who are given seats in the House of Lords. The present primate of all England, who is the 95th Archbishop of Canterbury, was nominated by King Edward soon after the death of Queen Victoria, and stands at the head of the Lords Spiritual. Among the most important and least known of the prerogatives of the Archbishop of Canterbury, is that of heading the commission of great dignitaries of the realm who form a species of council of regency in the event of any time intervening between the demise of a sovereign and the assumption of the reins of government by his successor. The Archbishop of Canterbury, in addition to an official residence within the cathedral precincts at Canterbury, and a stately palace in London, possesses a stipend of $75,000 a year. But few are aware of the sources from which this money is derived. It does not form part and parcel of the supplies voted every year by Parliament for the administration of the government. Nor is it derived from the revenues of the state, that is to say, from the pockets of the taxpayers. The Church of England is enormously rich. Not all ecclesiastical property was diverted from religious uses at the time of the Reformation. Much of it was left to endow the Church of England, and to-day the annual income of the latter is estimated at near $40,000,000, the administration of which is vested in the hands of a body known as the Ecclesiastical Commissioners, who pay to the archbishops and bishops their stipends, provide salaries for the minor dignitaries of the Church, and spend the remainder in improving the parochial endowments and buildings, and in providing funds for additional clergy. The Ecclesiastical Commission consists of the two archbishops, namely, of Canterbury and of York, of all the bishops of English and Welsh dioceses, of the deans of Canterbury, St. Paul, and Westminster; of five cabinet ministers, three judges of the High Court of Judicature, and twelve laymen, all of them churchmen of the Church of England, two being appointed by the Archbishop of Canterbury and the remainder by the crown.

The Commissioners have the power of creating new bishoprics, deaneries, and archdeaconries, of creating new parishes, of uniting existing ones, etc. But any of the more important steps which they take have to be ratified by the king and council, that is to say, by the sovereign sitting with a quorum of his Privy Council, and when thus ratified the acts of the Ecclesiastical Commissioners have the power of an act of Parliament.

The Archbishop of Canterbury, like the Archbishop of York and the 24 bishops who represent the Established Church in the House of Lords, is not a peer of the realm, but only a Lord Spiritual of Parliament. The Lords Spiritual have no right to demand trial by the House of Lords as peers, but are amenable to the jurisdiction of the ordinary courts of law. Although the Lords Spiritual of the upper house are distinct from the Lords Temporal, they do not vote separately, but jointly, forming for purposes of legislation one estate. The prelates vote on every subject brought before the Lords, except in trials for high treason and other cases of a criminal nature. On such occasions they never attend or vote; this, however, being in deference to those canon laws which forbid them from participating in matters of blood, and not owing to any parliamentary requirement. There can be no quorum of the House of Lords without the presence of an archbishop or bishop, two peers and a prelate being needed to constitute a House of Lords for the transaction of business, and the Spiritual Lords cannot vote or even take their seats in the House unless robed in their ecclesiastical vestments, with rochet, lawn sleeves and mortar-board cap complete. The discrimination between the peers of the realm and the Lords Spiritual of Parliament also extends to the families of the latter.

Lord's Supper (Lat. *Cœna Domini*, Fr. *La Sainte Cène*, Ger. *Abendmahl*), one of the sacraments of the Christian religion, in the observance of which Christians commemorate the death of the Founder of their religion. It is so called because the Lord Jesus Christ instituted the rite when he took his last meal with his disciples. It has also the names of *eucharist* and *communion*, and is celebrated by all Christian bodies however much their views may differ as to its nature and virtue, except the Quakers. It was instituted at the time of the Jewish passover, as we read in the gospels of Matthew, Mark, and Luke, the two former agreeing very closely in their accounts, while that of Luke has features of its own. A brief statement to the same effect is in 1 Cor. xi. There is no corresponding section in the fourth gospel, though in John vi., Christ speaks of the eating of his flesh and the drinking of his blood. In all the churches founded by the apostles the Lord's Supper was introduced. In the 1st and 2d centuries this rite was celebrated in connection with the *agapæ* or *love-feast*. After the third century when the congregations became more numerous, the *agapæ* ceased, and the Lord's Supper was from thence celebrated separately in the churches, in such a way that all present could partake, with the exception of catechumens (that is, Christians not yet baptized) and unbelievers. These were obliged to withdraw when the celebration of the Lord's Supper commenced, because communion was considered as a mysterious act, which was to be withheld from profane eyes. The deacons carried the bread of life to those whom sickness or imprisonment had prevented from being present at the meeting of the congregation. It was always believed to possess a peculiar efficacy, and ideas of the awful and mystical were associated with it. From the first, Christians ascribed supernatural power to the rite, and the consecrated bread and wine were regarded as more than mere bread and wine, and as having become, in some mysterious way, the body and blood of our Saviour. In the early Church we find no scientific formulation of the change undergone by the sacred elements, but in the 9th century, in consequence of the attacks of Berengarius (q.v.) on the doctrine of the Real Presence, the term, transubstantiation, commonly ascribed to Paschasius Radbertus first came into use to describe metaphysically the real and objective change of the elements of bread and wine into the body and blood of Christ. This term was adopted by the Council of Rome in 1079, and confirmed in 1215, in the Fourth Lateran Council, by Innocent III., and has ever since been employed by the Roman Catholic Church as the proper expression of her faith in the Eucharist. The Council of Trent in the 16th century laid it down as of faith to confess the «change of the whole substance of the bread into the body, of the whole substance (*substantiæ*) of the wine into the blood [of Christ], only the appearances (*species*) of bread and wine remaining; which change the Catholic Church most fitly calls Transubstantiation.» The Roman Catholic Church holds that the Eucharist has been both a sacrament and a sacrifice from the beginning. This, she declares, is evident from Christ's words of institution, as narrated in the synoptic gospels and from St. Paul's words in his first Epistle to the Corinthians. And unbroken testimony from the Apostles through the Fathers of the Church, she further avers, bears ample evidence to her claim; besides this, she claims that her own witness as the duly divinely appointed guardian of the deposit of revelation and its infallible interpreter commissioned to teach all nations, is sufficient seal to the truth of the doctrine. As a sacrament it is the true body and blood of Christ under the appearance of bread and wine to be partaken by the faithful as a means of grace and union with Christ; as a sacrifice it is the unbloody oblation of the body and blood of Christ by a duly appointed minister, that is, priest, by whom alone the elements can be consecrated. Such she declares has been the Christian teaching and practice from the beginning. The reception of the sacrament under both kinds, that is, under the forms of both bread and wine, was general until the Middle Ages, when communion under one kind, bread alone, began to be adopted, partly to avoid the danger of spilling the consecrated wine and partly to counteract a growing heresy that Christ was not received whole and entire under either kind alone. The Council of Constance, in the 15th century, made it universally obligatory to communicate under one kind to meet the heresy of Huss and Jerome of Prague. The Protestant reformers in the 16th century averred that the Church had deviated in the celebration of the Lord's Supper from the purpose of Christ and the example of the apostolic age, and both the German and Swiss reformers agreed in rejecting the doctrine of Transubstantiation and the mass, and maintaining that the Lord's Supper ought always to be celebrated before the whole congregation, and with the administration of both bread and wine. In explaining the words by which the supper was instituted, Luther and Zwinglius differed, and their different opinions on this subject formed the principal subject of the dissension between the Lutheran and Calvinistic churches. Luther took the words, «This is my body,» etc., in their literal sense, and thought that the body and blood of Jesus Christ were united, in a mysterious way, with the bread and wine, which, however, remain unchanged, so that the communicant receives, in, with, and under the bread and wine, the real body and blood of the Redeemer. Zwinglius, on the other hand, understood the words in a figurative sense, and supposed that Jesus Christ meant to say, «The bread and the wine represent my body and my blood,» and maintained, therefore, that the bread and wine were mere signs of the body and the blood of Christ, and that the Lord's Supper was a mere commemoration of the death of Christ, and a profession of belonging to his church, and this view was in substance adopted by the Socinians and Arminians. From this difference of opinion arose a violent dispute between Luther and Zwinglius, which in later times has been continued between the Lutheran and Calvinistic divines. The opinion advanced by Calvin, by which a spiritual presence of the body and blood of Christ is supposed in the communion, by partaking of which the faithful receiver is brought into union with Christ, through the medium of the Holy Ghost, though it came nearer to the Lutheran doctrine than that of Zwinglius did, yet was essentially different, and therefore also met with a strong opposition from the strict adherents of Luther. Melanchthon inclined to the Calvinistic notion, and so did many other Lutheran divines, who were called by the opposite party Philippists and Crypto-Calvinists. The *formula concordiæ*, or articles of religious peace, suppressed the Crypto-Calvinists in the greatest part of the Lutheran Church, and established the idea of Luther, consequently there was a final separation of the Lutheran and Reformed or Calvinistic churches, but in recent times many Lutheran divines hav. inclined to the Calvinistic doctrine. The Greek Church has substantially held the doctrine of Transubstantiation in its whole extent. The Oriental Christians differ from the Western, in using leavened bread in the Lord's Supper, and in administering it to children. (See Greek Church.) It thus appears that the differences between the contending churches hinge on the *mode* in which the body and blood of Christ are present in the elements of bread and wine, for that they are in some way present is admitted by them all. The Protestant churches hold that *presence* means presence in efficacy, and will admit that it is «real» in the sense of being efficacious, though not in the sense of being corporeal. However, when they are called on to define efficacy they differ in this, that some mean by it a sacrificial, and others a mysterious supernatural efficacy, emanating from Christ's glorified body. The confessions of the Protestant churches were framed expressly to conciliate the Lutherans, and contain, in consequence, more of the mystical element than is consistent with the sentiments of the framers, as expressed in their writings. The 28th article of the Church of England, while repudiating Transubstantiation as «repugnant to the plain words of Scripture,» declares «that to such as rightly, worthily, and with faith receive the same, the bread which we break is a partaking of the body of Christ, and likewise the cup of blessing is a partaking of the blood of Christ.» It further declares that «the body of Christ is given, taken, and eaten in the supper only after a heavenly and spiritual manner. And the mean whereby the body of Christ is received and eaten in the supper is faith.» The Westminster Confession, chap. xxix., s. 6 and 7, thus formulates the doctrine adopted by the Presbyterian Church of Scotland, which in the main agrees with that propounded by Calvin: «That doctrine which maintains a change of the substance of bread and wine into the substance of Christ's body and blood (commonly called Transubstantiation) by consecration of a priest, or by any other way, is repugnant not to Scripture alone, but even to common sense and reason, overthroweth the nature of the sacrament, and hath been and is the cause of manifold superstitions, yea, of gross idolatries. Worthy receivers, outwardly partaking of the visible elements in this sacrament, do then also inwardly by faith, really and indeed, yet not carnally and corporally, but spiritually, receive and feed upon Christ crucified, and all benefits of his death: the body and blood of Christ being then not corporally or carnally in, with, or under the bread and wine; yet as really, but spiritually, present to the faith of believers in that ordinance, as the elements themselves are to their outward senses.» The elevation, adoration, and carrying about of the host, practised in the Greek and Roman Catholic churches is thus spoken of in the 28th article of the Anglican Church: «The sacrament of the Lord's Supper was not by Christ's ordinance reserved, carried about, lifted up, or worshipped.» While the Roman Catholic Church makes its communicants receive the consecrated wafer with the mouth from the hands of the priest, the Protestant churches put the bread and the chalice into the hand of the communicant.

Lordwood. See Liquidambar.

Lorelei, lō'rĕ-lī, o **Lurlei,** loor'lī, a rock in the Rhine, near St. Goar, about 425 feet above the river. Once a serious menace to passengers on the river and always famed for its echo, the rock has been personified by German poets, notably Heine, as a siren, luring sailors to destruction by the music of her voice, an evident idealization of the danger of the rock and of its echo.

Lorente, Sebastian, să-băs-tĭ-ăn lō-rĕn'tĕ, Peruvian historian: b. about 1820; d. Lima November 1884. He was a professor of history at the University of San Marcos from 1845 and made valuable contributions to the historical literature of his country in his ‘History of Peru’ (5 vols., 1860); ‘History of the Conquest of Peru’ (1861); and articles in the ‘Peruvian Review.’

Lorenz, lō'rĕnts, **Adolf,** Austrian orthopædic surgeon: b. 1854. He was graduated from the University of Vienna in 1880, and worked as an assistant under Theodor Billroth in Vienna. On the advice of the latter he began specialization in orthopædic surgery, and after years of study developed his so-called «bloodless» method of reducing congenital dislocation of the hip joint. Before he developed his own method of operation he was one of the chief exponents of Hoffa's cutting method, which, however, he modified largely. His operation consists of the forcible stretching of all the soft parts about the hip until the head of the bone can be brought to the place where the socket should be (the acetabulum), and then holding it in that position and rotating the joint to secure it in the depression of the acetabulum. A plaster of paris cast is worn by the patient from six to nine months after the operation. Dr. Lorenz has performed this operation successfully in a large percentage of his cases; he demonstrated his method before the Medical Congress at Berlin in 1895; and has also given demonstrations in England and the United States. His visit to the United States (1902) aroused widespread interest and enthusiasm. He is now (1904) professor of orthopædic surgery at the University of Vienna and a government councillor. His publications include: 'Orthopädie der Hüftgelenks-Kontrakturen und Ankylosen' (1889); 'Das instrumentelle kombinierte Redressement der Hüftgelenks-Kontrakturen' (1898); and 'Ueber die Heilung der angeborenen Hüftgelenks-Verrenkung durch unblutige Einrenkung und functionelle Belastung' (1900).

Lorenz, lō'rentz, **Ottokar,** German historian: b. Iglau 7 March 1832. His first work was 'The Consular Tribunal' (1855). He was appointed professor of history in the University of Vienna, 1862, and in 1885 accepted a call to the University of Jena. Among his writings are: 'German History in the 13th and 14th Centuries' (1863); 'Sources of Mediæval German History' (1870); 'History of Alsace,' with Scherer (1871); 'History and Politics' (1876); 'Genealogical Manual of the History of European States' (1895).

Lorenzo, lō-rĕn'so, or **Lourenço Marques,** lō-răṅ'sō mär'kĕs, East Africa, a Portuguese province and port, the latter on Delagoa Bay, and the seacoast terminus of the railway to Pretoria in the Transvaal Colony, completed in 1895. A considerable import and export trade is carried on. Pop. (1898) 6,630, of whom 5,130 are Europeans. See Delagoa Bay.

Loreto, lō-rā'tō, Italy, city in the province of Ancona; about five miles from the Adriatic Sea and 15 miles south of the city of Ancona. It is situated in a fertile agricultural region, remarkable for its beautiful scenery. The city is known for its possession of the Santa Casa, said to be the house in which Jesus, Mary, and Joseph lived while in Nazareth. The building is 31 feet in length and 13 feet in width. It is enclosed in a stately domed church, the work of Bramante, and stands under the dome. The original outer walls have been covered, but inside the coarse stonework of the original masonry is visible. The material is a dark reddish-colored stone, unlike the stone in the vicinity. The tradition is that after the power of the Christians was destroyed in Palestine, by the capture of Acre, in 1291, on 10 May 1291, angels moved this house from Nazareth to the hill of Tersatta, near Fiume. After a time, on 10 Dec. 1294, the house was again removed by angels to the opposite side of the Adriatic, near Recanati; and again, in 1295, it was removed to where it now stands. Consult: Caillu, 'Histoire, Critique et Relig. de N. D. de Lorette' (1843); Hutchinson, 'Loreto and Nazareth' (1863); Jerome Angelita, 'Historie della Translatione della Santa Causa'; Kenrick, 'The Holy House of Loreto'; Meyrick, article on Loreto in 'Christ, Remembrances'; Stanley, 'Sinai and Palestine'; Zucchi, 'Istoria di Loreto.'

Loreto, Peru, an interior department watered for thousands of miles by the Marañon and its tributaries; area, 288,456 square miles; pop., chiefly Indians, 1896, 100,596. The quickest route from the coast to this province, which is only about 700 miles distant in a direct line, is round the northern coast of South America and up the Amazon, a journey of 6,500 miles. Loreto is separated from the coastal departments by the Andes, has a tropical climate, and is densely forested; the chief products are rubber and salt. The principal towns are Moyobamba (the capital, pop. 10,000), Taropoto, and Iquitos.

Lorette, Ancienne, ăn-sē-ĕn lō-rĕt, Quebec, Canada, a village seven miles southwest of Quebec city, with industries connected with the waterworks of Quebec. Pop. 1,600. Three miles to the north is Indian or Jeune Lorette, peopled by about 300 Christianized Indians, descended from the last of the Huron Indians who had found a refuge at Ancienne Lorette in 1650. The settlement was removed to Jeune Lorette in 1697. Jeune Lorette commands a fine view of Quebec for which it is visited, as also for the falls of Lorette, and for its ancient chapel and statue of the Virgin, a replica of those at Loreto, Italy.

Loria, lō'rē-ä, **Achille,** Italian economist: b. Mantua 1857. He studied law at Bologna, and proceeding successively to Rome, Berlin, and London, made a study of economical problems. In 1881 he was appointed professor of economics at Siena and 10 years later at Padua. He has approached the subject of wealth distribution and land-tenure in a hopeful spirit of optimism, and has published many works on the subject. Among his writings are: 'Studii sul Valore della Moneta' (1891); 'La Terra ed il Sistema sociale' (1892); 'La Costituzione economica odierna' (1889); and 'Il Capitalismo et la Scienza' (1901).

Lorica'ta. In zoology, (1) the group of pagolins (see Manis); (2) the group of *Crocodilia;* (3) a group of decapod *Crustacea,* which includes the spiny lobsters (*Palinurus,* etc.), and the bear-crabs (*Scyllarus, Ibacus,* etc.). These forms are large, with thick shells and without pinching claws. All are edible, the spiny lobster replacing the true lobster as an article of food in the warmer parts of the earth.

Lorient, lō-rē-ŏṅ, or **L'Orient,** France, a fortified seaport town, in the department of Morbihan, at the mouth of the Scorff, on the Bay of Biscay; about 40 miles west of Vannes. It was founded in 1666 by the East Indies Company, and in 1690 it became a military fort. After the dissolution of the company, in 1782, the government bought the ship-building plant. The large harbor can accommodate with safety a great number of vessels. Lorient is a station of the French fleet, and has extensive docks and building yards for the construction and fitting out of war vessels. It has, also, large artillery barracks, an artillery park, and a marine arsenal. It has an observatory, schools of marine, artillery, and hydrography, and other educational institutions, and a large number of manufacturing establishments. About five miles south of Lorient is the fortified town of Port Louis.

Lorikeet', a small kind of lory (q.v.)

Lorimer, lôr'ĭ-mėr, **George Claude,** American Baptist clergyman: b. Edinburgh, Scotland, 1838; d. Aix-les Bains, France, 7 Sept. 1904. He came to the United States in 1856 and was educated at Georgetown College, Ky. In 1859 he was ordained to the Baptist ministry, and held pastorates at Harrodsburg, Paducah, and Louisville, Ky.; he was then at Albany for a short time, at the Shawmut Avenue Church and Tremont Temple in Boston in 1870–9; and in Chicago till 1891. In the latter year he returned to Boston to become pastor at Tremont Temple. In 1902 he went to New

York as pastor of the Madison Avenue Church. He was associate editor of the 'Watchman' and has written 'Isms Old and New' (1882); 'Under the Evergreens' (1872); 'The Great Conflict' (1876); 'Studies in Social Life' (1886); 'Christianity and the Social State'; 'Christianity in the Nineteenth Century'; 'Messages of To-day to the Men of To-morrow' (1897); and a 'Master of Millions' (1903), a story of modern life.

Lorimer, George Horace, American journalist: b. Louisville, Ky., 6 Oct. 1868. He is a son of G. C. Lorimer (q.v.), and was educated at Colby College, and at Yale. Entering the field of journalism, he advanced steadily in his profession, and since 1899 has been editor-in-chief of the 'Saturday Evening Post,' Philadelphia. He has written 'Letters from a Self-made Merchant to his Son' (1902).

Lorimer, John Henry, English painter: b. Edinburgh 1856. He was educated at the Edinburgh Academy and University, and began his art studies at the Royal Scottish Academy. One of his pictures was admitted to the annual exhibition of that institution when he was but 19. His most important exhibited pictures are 'The Ordination of Elders'; 'Pot Pourri'; 'The Eleventh Hour' (1896), which received a second class medal at the Salon, and in 1890 was awarded a gold medal at the Paris Exposition. In 1894 the French government bought his 'Benedicite,' which is now in the Luxembourg, where his portrait of Colonel Anstruther Thompson has also been deposited.

Lorimer, Norma Octavia, Scottish novelist: b. Auchterarder, Perthshire, 1864. She has been an extensive traveler, having spent three years in the United States, and has written 'Josiah's Wife'; 'By the Waters of Sicily' (1901); 'Catherine Sterling' (1902); etc.

Loring, lōr'ĭng, **Charles Greeley,** American lawyer and orator: b. Beverly, Mass., 1794; d. 1868. He was graduated from Harvard in 1812 and practised his profession in his native city, becoming in 1857 actuary of the Massachusetts Hospital Life Insurance Co. In 1862 he entered the State senate. He was of much prominence as an orator and was the author of 'Neutral Relations between the United States and England' (1863); 'Life of William Sturgis' (1864).

Loring, Charles Greeley, son of the preceding: b. Boston 1828; d. Pride's Crossing, Beverly, Mass., 20 Aug. 1902. He was graduated from Harvard in 1848 and served in the Union army during the Civil War, being brevetted major-general of volunteers at its close. He became a trustee of the American Museum of Fine Arts in 1873 and was the executive officer of the institution from 1876 until his death.

Loring, Edward Greeley, American jurist: b. Massachusetts 1802; d. 1890. He was graduated from Harvard, and for many years was probate judge and United States Commissioner in Boston. While holding this post he sent back into slavery the negro Anthony Burns, and for this act was removed from the bench. In after years he was appointed by President Lincoln judge of the Court of Claims, which post he resigned in 1877.

Loring, Ellis Gray, American lawyer: b. Boston 1803; d. 1858. He was educated at the Boston Latin School, entered Harvard in 1819, but without graduating left college and studied law. In 1827 he was admitted to the bar, where he soon won high distinction. He was one of the first pleaders for the abolition of slavery, and one of the founders of the first anti-slavery society, in Boston, 1832, whose constitution he wrote. As a defender of fugitive slaves he gave freely of his time and talents, and shared the odium visited upon all the early abolitionists. Before the Supreme Court of Massachusetts he made a memorable defense of a slave-child called Med, by which, against so formidable an opponent as B. R. Curtis (q.v.), he secured a decision declaring that every slave brought into that State thereby became legally free. The effect of his convincing argument was both instantaneous and lasting, and his triumph was a substantial service to the anti-slavery cause. He published numerous addresses on the slavery question.

Loring, George Bailey, American agriculturalist: b. North Andover, Mass., 8 Nov. 1817; d. Salem, Mass., 14 Sept. 1891. He was graduated from Harvard in 1838 and from the Harvard Medical School in 1842, and after several years of medical work at the Chelsea Marine Hospital devoted himself from 1850 onward to scientific agriculture, writing many essays and papers on farming and allied topics. He became famous as an orator, served several terms in the Massachusetts legislature, was member of Congress 1876–81, United States commissioner of agriculture 1881–5, and minister to Portugal 1889–90. He was president of the Massachusetts State Agricultural Society for many years.

Loring, William Wing, American general: b. Wilmington, N. C., 4 Dec. 1818; d. 30 Dec. 1886. He entered the United States army as a private in a troop of volunteer cavalry, and was active in the Florida war in 1835–42. During the war with Mexico he was distinguished for bravery at Contreras, Churubusco, and Chapultepec, and was brevetted lieutenant-colonel and colonel. Although opposed to secession he held States Right views and in May 1861 resigned his commission and became a brigadier-general in the Confederate army and later major-general. For a few years after the close of the war he was a banker in New York, then went to Egypt in 1869 and was made a pasha and chief of staff in the army of the Khedive. In 1879 he returned to the United States and published a description of his Oriental experiences in 'A Confederate Soldier in Egypt' (1883).

Loris. See Lemur.

Loris-Melikoff, lō'rĭs-mĕl'ĭ-kŏf, **Mikhail Tarielovitch Tainoff,** Count, Russian soldier and statesman: b. Tiflis, Russia, 1 Jan. 1826; d. Nice, France, 22 Dec. 1888. He was of Armenian descent, entered the army in 1843, and distinguished himself at the siege of Kars in 1854. He served in the Crimean war and was made lieutenant-general in 1863. In the Turco-Russian war of 1877 he took Kars in November and for his services in the campaign was made a count in 1878. In 1880 he was appointed minister of the interior, in which post he showed a tendency toward liberal measures, but on the accession of Alexander III. his position became untenable, and he resigned.

Lorna Doone, lôr'nạ doon, a romance of Exmoor, a famous novel by R. D. Blackmore, published in 1869. It is its author's best-known work, and its popularity has been equally great on both sides of the Atlantic. Much as Hardy acquaints us with Wessex, Blackmore impresses Exmoor upon us. It is out-of-door England, with swift streams, treacherous bogs, dangerous cliffs, and free winds across the moors.

Lorne, lôrn, Marquis of (John George Douglas Sutherland Campbell). See Argyle, Campbells of.

Lorraine, lŏ-rān'. See Alsace-Lorraine.

Lorraine, Claude. See Claude Lorraine.

Lo'ry, any of several East Indian parrots, but more especially one of the brush-tongued family *Trichoglossidæ,* the smaller examples of which go by the name of lorikeets. Both the lories and the lorikeets are remarkable for their extensible tongue, furnished with a pencil at its extremity, by which they are enabled to lick up the nectar of flowers. The lorikeets are smaller than the lories, and have long tapering tail-feathers. Swainson's lorikeet (*T. novæ-hollandiæ*) is the best-known species. It is found in eastern Australia and Tasmania, and is popularly known as the blue mountain lory or the blue mountaineer.

The name lory is also given to the large brilliantly colored parrots of the psittacine genus *Eclectus.* Consult Newton, ‹Dictionary of Birds› (1896) and see Parrots.

Los Angeles, Cal., city, county-seat of Los Angeles County; on the Los Angeles River, about 20 miles from the mouth, and on the Atchison, Topeka & Santa Fé; the Southern Pacific, the Southern California, the Los Angeles & Salt Lake, and the San Pedro R.R.'s. The pious Spanish pioneers who first introduced civilization in Alta California were in the habit of giving names to places in accordance with the church calendar. Consequently when mass was first celebrated on the present site of the city, it was named *Nuestra Senora Reina de Los Angeles,* which the practical «Yankees,» upon their arrival, at once proceeded to shorten to Los Angeles. Los Angeles is situated about 15 miles in an air line from the Pacific Ocean, in the valley of the Los Angeles River, a dry river bed in summer, but in winter sometimes a lively stream, for a short time after a heavy rainfall. There are mountains on the north and west. The city covers a large area of ground, the old city limits embracing an area of six miles in each direction, with the old plaza in the centre. To this area several large additions have been made during the past few years. The average altitude is about 300 feet above sea-level. Every variety of location for a residence may be found within the city limits, about a third of the city being hilly, with commanding views of the surrounding country. Los Angeles was settled in 1781. While the country was a Mexican province, Los Angeles and Monterey alternated as the capital of California.

The city has railroad competition in the shape of three transcontinental lines, the two Southern Pacific systems, by way of Ogden and El Paso, and the Santa Fé, by way of Albuquerque. Work is now progressing on a fourth system by way of Salt Lake, which will shorten the distance from Los Angeles to Chicago over 200 miles. Altogether, there are a dozen lines of railroads leading to Los Angeles. The Pacific Coast Steamship Company runs vessels every few days from Los Angeles county ports to San Francisco and San Diego.

Los Angeles is an old place, having been founded 4 Sept. 1781, by soldiers from the mission of San Gabriel, under the protection of the Spanish governor. Modern Los Angeles is, however, less than twenty-five years old, for it was not until more than half a century after its founding that it began to take shape as an American city. Since then, its growth can only be described as wonderful. A city that in less than a quarter of a century has increased its population from 11,311 in 1880 to 135,000 (conservatively estimated) in 1903, is certainly something remarkable, even in the rapidly growing West. It is only within the past 20 years that the real growth of modern Los Angeles has taken place. In 1883 the city was a somnolent semi-Mexican pueblo of about 12,000 souls, without any public buildings and with only one private building of architectural pretensions, a considerable proportion of the residences being constructed of adobes, or sun-dried bricks, such as are commonly used in Mexico and oriental countries. The entrance of the railroad brought home-seekers in large numbers to Los Angeles and vicinity; the Atchison, Topeka & Santa Fé Railroad was opened in November 1885. In 1886–7 the record transfers of property amounted to $100,000,000, prices of outside property in some cases being pushed up to ridiculously high figures. There was, of course, a period of stagnation following the subsidence of this wild speculative movement, but the fact that there was no general crash is a proof that the prosperity of the city was well founded.

There are a dozen public parks within the city limits, aggregating over 600 acres, four of them having lakes of considerable size. Elysian Park, the largest within the city limits, is a wild and picturesque hill tract. To these was recently added, through the beneficence of a citizen, Griffith Park, a picturesque mountainous tract of over 3,000 acres, a short distance north of the city limits. Work has commenced (1903) on a system of boulevards which is intended to connect the various parks. Los Angeles is a city of homes; a large proportion of the people owning their own dwellings. There are many attractive cottages, embowered in climbing plants, roses, heliotrope and vines often covering the entire side of a house, while the lawns are adorned with palms, bananas and other semi-tropical trees. The city is practically frostless, callas, heliotropes, and other delicate plants flourishing throughout the winter in the open air. In the southwestern and western sections of the city are hundreds of handsome mansions, in various pleasing styles of architecture. The residence streets are generally aligned by shade trees, the most popular of which are the pepper, with its bright red berries, and the grevillea, with its feathery yellow blossoms.

There are over 200 miles of graded and graveled streets in the city, 20 miles of paved streets, 350 miles of cement and asphalt sidewalk and 160 miles of sewer, the sewer system extending to the ocean. The city is brilliantly lighted, having been the first city in the United

States to entirely abandon gas for street lighting and replacing it with electricity, which was done over 20 years ago. It is now one of the best lighted cities in the Union, the lights being on tall masts.

The electric street railway facilities are excellent. The total mileage of single track is about 200 miles. In addition to the local electric lines, there are half a dozen suburban lines, extending to various points from 10 to 20 miles from Los Angeles, and work is rapidly progressing on a vast interurban system of electric railroads, that will extend from San Diego on the south to Santa Barbara on the north, each place being about 125 miles from the city. The wealth and general prosperity of Los Angeles are founded largely upon the abundant natural resources. The healthy climate and beautiful scenery attract many visitors and home-seekers. The oranges shipped annually average 20,000 car loads, which bring about $500 for each car. The following table prepared by the Los Angeles Chamber of Commerce shows the estimated value of the principal products of the seven southern counties — the immediate tributary country of Los Angeles — for 1902. These aggregate $82,000,000, including $24,000,000 of miscellaneous manufactured products. The principal items in the list are as follows:

Citrus fruits	$14,000,000
Gold and silver	5,674,000
Petroleum	6,000,000
Borax	1,274,700
Hay	3,300,000
Vegetables and fruits consumed	3,000,000
Dried fruits and raisins	2,000,000
Grain	3,000,000
Canned goods	1,500,000
Sugar	3,600,000
Nuts	1,400,000
Cement, clay, brick, sandstone and granite	1,278,000
Beer	1,000,000
Beans	1,800,000
Pork, beef, mutton — dressed	3,234,000
Miscellaneous manufactured products	24,000,000

This, however, is only a small portion of the trade products of Los Angeles. The merchants of the city, wholesale and retail, and the manufacturers, do a large and increasing business with a section of country extending from central California to New Mexico. The manufacturing industry has been greatly stimulated by the supply of petroleum fuel at a low price and by the bringing of electricity from the mountain streams a distance of nearly 100 miles. The United States census gave the value of manufactures in Los Angeles for the year ended 19 June 1900 at $21,297,727, since which time it has vastly increased.

The banks of Los Angeles are noted throughout the country for their generally solid and prosperous condition, with deposits aggregating nearly $50,000,000. The clearings of the Los Angeles banks for the year 1902 amounted to over $243,000,000. The value of the buildings erected in Los Angeles during 1902 amounted to nearly $10,000,000, and for 1903 will be considerably more. The annual municipal expenditures are about $1,355,000; the chief items of expenses are: for schools, about $446,000; for the police department about $130,000; for the street cleaning, $90,000; for the fire department, $126,000; for municipal lighting, $44,000; for parks, $56,000.

The principal harbor of Los Angeles is at San Pedro, where for several years the government has been engaged in constructing a great breakwater that will cost over $3,000,000, and which will permit the entrance to the harbor of deep-sea vessels, when Los Angeles expects to make a bid for trans-Pacific trade. The city is the seat of the University of Southern California, opened in 1880 by the Methodist Episcopals; a State Normal School; Saint Vincent's College, opened in 1865 by the Roman Catholics; Occidental College, opened in 1887 by the Presbyterians; three academies under the Roman Catholics, a public high school, and public and parish schools. There is a public library of 65,000 volumes, the Blanchard Art Gallery, and extensive botanical gardens. It has several hospitals, homes for the friendless, and orphanages. Some of its prominent buildings are a Government building, the county court-house, the city-hall, cathedral, opera house. There are a number of buildings of historic interest, as General Frémont's headquarters, the Plaza Church, some of the adobe houses, homes of the first settlers. The mayor holds office for two years; he appoints five trustees for the library, and is ex-officio a member and chairman of several committees. The council has four commissioners who have charge of police, health, fire and park departments. The board of education consists of nine members chosen by popular election, one from each ward.

Los Angeles has a cosmopolitan population, drawn from every State in the Union, and from almost every country in the world. The people are intelligent, cultured and enterprising. There are numerous churches, several fine theatres, a first-class public library, and a number of clubs for men and women. According to the United States census, the city made the largest percentage of increase of population of any city in the United States during the decades 1880–1900. Los Angeles has for many months led all American cities in increase of postal receipts, of bank clearings, and of buildings erected. Pop. (1880) 11,183; (1890) 50,395; (1900) 102,479. In 1900 the foreign born population was 20,000.

HARRISON GRAY OTIS,
Editor of the Los Angeles ‹Times.›

Lossing, lŏs'ĭng, **Benson John,** American historian and engraver: b. Beekman, Dutchess County, N. Y., 12 Feb. 1813; d. near Dover Plains, N. J., 3 June 1891. In 1826 he was apprenticed to a watchmaker in Poughkeepsie and subsequently entered into partnership with his employer, but in 1835 relinquished the business, and became joint owner and editor of the ‹Poughkeepsie Telegraph.› He soon after settled in New York as an engraver on wood, and at the same time edited and illustrated the ‹Family Magazine.› His connection with his newspaper enterprises in Poughkeepsie, however, continued until 1841. That year appeared his ‹Outline History of the Fine Arts,› followed in 1847 by an illustrated work, ‹Seventeen Hundred and Seventy-Six,› and in 1848 by ‹Lives of the Signers of the Declaration of Independence.› His ‹Pictorial Field Book of the Revolution› was issued in numbers in 1850–2, with more than 1,000 illustrations by himself. In the preparation of this work, which is remarkable for the minute and accurate information which it conveys, the author traveled at different times upward of 9,000 miles, visiting every important battlefield of the Revolution, and making sketches on the spot. Among other works are: ‘Illustrated History of the United States for Schools and Families’ (1854); ‘Our Countrymen, or Brief Memoirs of Eminent Americans’ (1855); ‘Primary History of the United States’ (1857); ‘Mount Vernon and its Associations,’ illustrated by himself (1859); ‘Life and Times of Philip Schuyler’ (1860); ‘Life of Washington’ (3 vols.) (1860); ‘Lives of the Presidents’; ‘Pictorial Field Book of the War of 1812’ (1868); ‘The Civil War in America’ (1866–8); ‘The American Centenary’ (1875); ‘Cyclopedia of United States History’ (1881); ‘Compendious History of the Commonwealth of New York’ (1887).

Lost Cause, The, a phrase which first became current as the title of a history of the Civil War (1886) by E. A. Pollard. It is used as an expressive designation for the purposes and aims which the Southern people, through the war, vainly sought to realize in the permanent establishment of the Confederate States of America.

Lost Chord, The, title of poem written by Adelaide A. Procter. It was first printed in ‘Household Words,’ and appeared again in her collection of ‘Legends and Lyrics’ (1858). The verses were set to music by Sir Arthur Sullivan, whose spirit was so attuned to that of the poet that words and music, both sounding a strain of grandeur, intellectual and emotional, may be regarded as mutually interpretative.

Lost or **Hidden Island,** an appellation anciently applied to Cephalonia, early navigators often being unable to find it on account of its diminutive size. The name also has been given to islands in different parts of the world that once discovered have disappeared or have not been found again.

Lost Pleiad, plē'ăd, a star of the Pleiades constellation which tradition says was once visible, being the seventh of that cluster. Only six stars are now to be seen with the naked eye. Probably the origin of the story is less astronomical than mythological. The legend figures in poetry and in art, a poem by Letitia Landon and a painting by Thomas Buchanan Read each bearing the title.

Lost Property, strays and waifs excepted, may be retained by the finder with impunity, after proper means have been taken to advertise it; and if it cannot be conveniently preserved without hazard he may dispose of it if not claimed. If, however, the loser can identify his property he has a right to restitution, and a third party purchasing lost property from the finder must restore it to the owner, if called upon, and may proceed against the seller for satisfaction. The owner of lost movables must not only prove that they once belonged to him, but that he lost possession either by the fraud of some other party, or in such a way that the ownership still remained with him. The finder's “special property” in his find makes his title good against all save the real owner; the most striking exception is in the case of treasure-trove, that is, hidden valuables, of which, in England, a share goes to the crown, to which notice of such finding must be made. In the United States the law is less clear as to treasure-trove; but it is distinguished from other found property in that the finder has not so good a title as the owner of land in which valuables are found, whereas the finder's title to property found in dwellings, and especially in stores and other semi-public places, is better than that of the owner of the premises. A derelict (q.v.) is distinguished from lost property in that it passes from possession of the owner with his knowledge and consent. Lost property at sea is governed by peculiar principles. The limitation is one year, within which time the possessor may recover property upon the payment of expenses of the finder and of the remarkably heavy percentage of its value called salvage. There are certain cases in which a jury will construe the retention of lost property into larceny. If the finder knows the owner, or can readily discover him, the taking with the intent to keep will amount to larceny. But the more common ground for action in America is detinue, that is, the unlawful retention of property. Obviously there is no recourse if the property detained be of such a character that it cannot be identified.

Lost River, a short stream in the northwestern part of West Virginia, which disappears from view in one part of its course. It passes for some distance along underground channels but reappears again.

Lot, according to the book of Genesis, the son of Haran, and the nephew of Abraham. In order to avoid dissensions between his followers and those of Abraham, he went east into the plain of Jordan, toward Sodom, while his uncle dwelt in Canaan. Having been taken captive by some marauders (styled kings in Gen. xiv.), Lot was delivered by Abraham. Having received two angels into his house in Sodom, an attack was made upon it by the inhabitants, who were struck blind, and the impending destruction of the city was announced to Lot. He escaped with his family; but his wife, looking back “became a pillar of salt.” The name “Lot's wife” is still given to a detached pillar about 40 feet high, on the Jebel Usdûm, a height near the Dead Sea.

Lot (ancient *Loda* or *Olitis*), France, one of the largest tributaries of the Garonne River, rises at Mount Lozère, one of the Cevennes, near Mende, department of Lozère. It flows west by south across the departments of Lozère, Aveyron, and Lot, and joins the Garonne at Aiguillon, in the department of Lot-et-Garonne. Total course about 250 miles, of which 180 miles, commencing at Entraigues, are navigable.

Lothair (lō-thār') I., Roman emperor, eldest son of Louis-le-Debonnaire: b. about 795; d. Prüm, Prussia, 29 Sept. 855. He became associated with his father in the government of the empire in 817 and was crowned and named King of the Lombards in 820. On his father's death Louis and Charles, his brothers, joined their forces and defeated him at Fontenay in June 841. In 843 the three brothers concluded the noted treaty of Verdun, by which Lothair retained the title of emperor, with Italy, and some French provinces beyond the Rhine and the Rhone. Charles then became king of France, and Louis received a tract of country bordering on the Rhine.

Lothair II., called The Saxon, Roman emperor: b. about 1060; d. near Trent 4 Dec. 1137. He became duke of Saxony in 1106 and was elected king of Germany in 1125 and crowned by Pope Innocent II. in 1133.

Lothair, a novel by Benjamin Disraeli, published in 1870. The scene of this extravagant, but remarkable, story is laid chiefly in England about the period of its publication. The hero, Lothair, a young nobleman of wide estates and great wealth, has been surrounded by a Protestant atmosphere. When, in accordance with his father's will, he goes to Oxford to complete his education, his other guardian, Cardinal Grandison, determines to bring him into the Roman Church. The story is a graphic description of the struggles of rival ecclesiastics, statesmen, and leaders of society to secure the adherence of the young nobleman.

Lo'throp, Amy. See Warner, Anna Bartlett.

Lothrop, Harriet Mulford Stone, «Margaret Sidney,» American writer for young people: b. New Haven, Conn., 4 Oct. 1844. She was married to the Boston publisher, D. Lothrop, in 1881, and was founder and president of the National Society of the Children of the American Revolution. Among her numerous publications, mainly for young people, may be cited: ‹The Five Little Peppers› series (1882–1903); ‹So As by Fire› (1881); ‹The Pettibone Name› (1883); ‹The Golden West› (1885); ‹The Minute-Man› (1886); ‹Dilly and the Captain› (1887); ‹Little Maid of Concord Town› (1898); ‹The Judge's Cave: a Romance of the Days of Regicides›; etc.

Loti, Pierre, pē-är lō-tē. See Viaud, Louis Marie Julien.

Lo'tion, a wash, solution, or medicinal mixture for external application to the body; usually a liquid remedy, consisting principally of water, as a menstruum, and applied to circumscribed portions of the skin, or of the mucous surfaces. Lotions are either cooling, stimulating, astringent, soothing, or sedative. Water combined with spirit or vinegar is an example of the first. The spirit is added to the water in the proportion of half an ounce and upward to the half-pint. The lead lotion is at once cooling and astringent. A good stimulating lotion is procured from a mixture of water with a third or a half of its bulk of spirit of wine, which is applied to the skin by means of lint, and covered to prevent evaporation. Astringent lotions are formed by adding from 1 to 10 grains of sulphate of zinc or of white vitriol to an ounce of very cold water, having other astringents in solution. Soothing lotions consist of the various preparations of opium, of the decoction of poppies, hemlock, etc., and prussic acid is employed in the preparation of sedative lotions. Stimulating lotions are applied to indolent ulcers and tumors, and sedative and narcotic mixtures are employed to alleviate pain.

Lotophagi, lō-tŏf'ạ-jī. See Lotus-eaters.

Lot'ta. See Crabtree, Charlotte.

Lotter (lŏt'tĕr) **Family,** a family of printers in Germany, the founder of which, Melchior Lotter, born at Aue, appeared in Leipsic about 1491. There his publications of breviaries and missals brought him reputation, which his larger enterprises extended. He published: ‹Persius› (1512); ‹Horatii Epistolæ› (1522); ‹Lutheri Tessaradecos Consolatoria pro Laborantibus› (1520); etc. One of his innovations was the reservation of Gothic types for German and use of Roman for Latin. He is supposed to have given at least secret sympathy and aid to the Reformation. His son, Melchior, who died about 1540, was the original printer of Luther's Bible (1522–4), and was succeeded by Hans Lufft (q.v.). His publications also included various works of Luther, Melanchthon, and other writers.

Lot'tery, a public gambling scheme, by which, for a valuable consideration, one may by favor of the lot obtain a prize of a value superior to the amount or value of that which he risks. In its best and most frequent application, the word describes those schemes of this nature which are conducted under the supervision and guaranty of government, and the proceeds of which are devoted to public objects. Almost all modern states have, at some period of their history, employed lotteries as a means of revenue. But though they supply a ready mode of replenishing the public treasury, they have always been found to exert a mischievous influence upon the people. The poor are invited by them rather than the rich. They are diverted from persistent labor and patient thrift, by the hope of sudden and splendid gains; and as it is the professed principle of these schemes to withhold a large part of their receipts, a necessary loss falls upon a class which of all in the community can least afford to bear it. Between the years 1816 and 1828 the French government derived from lotteries an annual income of $2,400,000. Some years later the government suppressed them, and in January of the next year $110,000 more were found to be in the savings banks of Paris alone than in the same month of the preceding year. In several European states government lotteries are still maintained. They have became an almost indispensable source of revenue; and they are defended by the argument that as the passion for play is irrepressible among the people, and their money would otherwise be invested in foreign or in secret and less fairly managed schemes, the state may well assume the conduct of lotteries at home; that under its supervision the evils attendant upon them are diminished, and their earnings are devoted to the public welfare. There were lotteries in ancient Rome and in England as early as 1659.

In the United States, the lottery has been from the earliest settlement of the country a familiar means of raising funds, which in this country could have been secured in no other mode so easily if at all. The Virginia company derived a large profit from English lotteries, and the influence of them extended gradually to the eastern colonies; for it is reported that an assembly of ministers at Boston in 1699 denounced the lottery as «a cheat,» and its agents as «pillagers of the people.» Generally, however, lotteries enjoyed a fair reputation, and certainly were soon extensively employed throughout the country. In the 18th century they were extraordinarily popular in America. Legislatures authorized lotteries for every species of public improvement, for the building of churches and colleges, for the repair of losses to individuals by fire and otherwise; for example, Faneuil Hall, after the fire of 1761, was rebuilt by lottery. The Continental Congress tried to raise money by lottery in 1777.

In 1833 a society was formed in Pennsylvania which advocated their suppression. In July 1834 the society issued an address to the public, setting forth its objects and views. It is to the efforts of this society that we should mainly attribute the action of most of the States in prohibiting the further establishment of lotteries. Where they are not especially authorized (and in some States the constitution expressly forbids the legislature to authorize them), the parties concerned in them are, in nearly all the States, subject to the imposition of heavy penalties. There exist in the State reports many cases where the provisions of State statutes concerning lotteries have been construed by the courts, but these decisions are necessarily of a particular character, and no important general principles can be derived from them. In Tennessee and Virginia, the acts abolishing lotteries have been by express decisions pronounced constitutional. In Massachusetts, a clause in such an act authorizing a search for tickets provided for the purpose of drawing a lottery is not held to be inconsistent with that article of the bill of rights which declares that every subject has a right to be secure from all unreasonable searches and seizures of his house or person. In New York and Pennsylvania lotteries are declared to be public nuisances, and they may therefore be indicted as such. The schemes known as art unions are held to be lotteries by express decisions. In the language of the court in New York: «These associations distribute a small number of prizes among a great number of persons. The prizes and blanks are drawn in the same manner as in other lotteries. The intention of these schemes is to sell works of art for more than they can be sold for at private sale, and this is to be brought about by an appeal to the universal passion for playing at games of chance. They have all the attributes and elements of lotteries.»

The sums annually employed by Americans in lottery speculations probably amounted to hundreds of thousands. The last lottery supported by governmental encouragement was the Louisiana State Lottery. An Act of Congress passed in 1890 attempted to crush it by forbidding it the use of the United States mails, which act compelled its removal to Honduras, where in 1903 it was still in existence, and thousands of tickets for this lottery were sold monthly in the United States, particularly on the Pacific Coast, where as late as November 1903 the daily newspapers issued «extras» giving the winning numbers in the drawings of the Honduras company

Lot'to, a game having its origin in Italy but now played occasionally in other countries. It is played on boards, divided in 27 small squares, arranged in three horizontal rows; five squares in each row are marked with numbers between 1 and 90, four of the squares being left blank. Each person playing is provided with a board upon which he covers the space marked with the particular number called out by the dealer, who draws the counters from a bag. The player who first covers all the five numbers on any horizontal row is declared the winner.

Lo'tus, a popular name for a large number of unrelated plants, and also a generic name for certain plants of the natural order *Leguminosæ*. The genus contains between 50 and 100 species of herbs or sub-shrubs common in the temperate zones. They have trifoliate leaves; pea-shaped, yellow, red, or white flowers, generally in axillary umbels; and linear or oblong pods. The best known species are probably *L. corniculatus* and *L. tetragonoglobus*, the former popularly known as bird's-foot trefoil and babies' slippers, the latter as winged pea. The former is a perennial often planted in dry soils for ornament and for forage; the latter, an annual whose young pods are eaten like string-beans, and the ripe seeds used as a substitute for coffee.

As a popular name, lotus is applied to various water-lilies, especially to certain African and Asiatic kinds, which were held to be sacred to national deities, and were also symbolical of the world, the residence of the gods and of beauty. The fruits of several plants known by this common name have been used for food; for instance, *Zizyphus lotus*, a close relative of but inferior to the jujube (q.v.), *Celtis australis*, the hackberry, *Nitraria tridentata*, *Rhamnus lotus*, and *Nelumbo lutea*, an American plant also known as water chinquapin and yellow water-lily.

The date, plum or persimmon is sometimes called lotus from the specific name of one of its species, *Diospyros lotus*, which by some writers is supposed to be the plant whose fruit was eaten by the fabled lotus-eaters, and whose juice made into wine caused these people to forget their native land. In this connection other plants have been similarly designated; for instance the blackberry and *Zizyphus lotus* mentioned above.

Lotus-eaters (Latin *Lotophagi*), in ancient Greek legends a people on the north coast of Africa who lived on the fruit of the lotus-tree. According to Homer they received Ulysses and his followers hospitably, but the sweetness of the fruit induced such a feeling of happy languor that they forgot their native land and ceased to desire to return to it, their sole object being to live in delicious dreamy idleness in Lotusland. See LOTUS.

Lotze, Rudolph Hermann, German philosopher and physiologist: b. Bautzen, Saxony, 21 May 1817; d. Berlin 1 July 1881. He studied philosophy and medicine at Leipsic and in 1842 was appointed extraordinary professor of philosophy in that University, and in 1844 ordinary professor in Göttingen. In 1881 he filled the same chair in Berlin. His philosophical position is that of a teleological idealist, and he makes metaphysics to be destitute of all independent existence, apart from ethics. The Universe has its cause in the notion of the Good, which underlies all the phenomena and activities of the world. His position as a teleologist is the same as that of Asa Gray, and while allowing that mechanism obtains in the movements of the universe he denies that this excludes the possibility of creative design. Lotze is, however, considered to have done his most original work in the domain of psychology. He teaches that our space-consciousness is built out of the distinctive, non-spatial sense-attributes, which vary according to the locality of the sense-organs stimulated. Among his works are: 'Metaphysik' (1841); 'Logik' (1843); 'Mikrokosmus' (1856-64); and 'Geschichte der Aesthetik in Deutschland' (1868).

Loubat, Joseph Florimond, zhō-zĕf flō-rĭ-mônd loo-bä, Duc de, French author and philanthropist: b. New York 21 Jan. 1831. He was graduated from the University of Paris and has been a liberal giver to public institutions, among his benefactions of this character being a gift of $1,000,000 to Columbia University, including valuable books and MSS. He has likewise given much to the Roman Catholic Church, and in recognition of this fact received his title of Duc de Loubat from Pope Leo XIII. in 1893. He has written: 'Narrative of the Mission to Russia in 1866 by G. V. Fox'; 'Medallic History of the United States.'

Loubet, Emile, ā-mēl loo-bā, French statesman: b. Marsanne (Drôme) 1838. He was graduated in law at Paris, in 1865 was admitted to the bar at Montélimar, attracted attention by his legal ability, became counsel for the Paris, Lyons, and Mediterranean railway, in 1869 was elected conseiller d'arrondissement, and 4 Sept. 1870 was chosen mayor of Montélimar. Elected in 1871 to the general council of the Drôme, of which he afterward (1885) became president, he was returned to the Chamber of Deputies for Montélimar in 1876, where he served with the Republican left until 1885. In 1885 he entered the Senate for the department of the Drôme, and from December 1887 until April 1888, when he retired with his colleagues of the ministry, filled with much credit the post of minister of public works in the Tirard cabinet. He was chairman of the finance committee of the Senate in 1890, chairman of the customs committee in 1893; and on 29 Feb. 1892 was made premier by President Carnot. His cabinet, in which he held the portfolio of the interior, lasted until November of that year, when its retirement was caused by attacks on its supposed laxity in the prosecution of the Panama case. In 1896 he was chosen president of the Senate. Upon the sudden death of President Faure (16 Feb. 1899), the National Assembly met in congress (18 February) and elected Loubet president of the Republic on the first ballot. His position in politics is that of a moderate Republican, without the tendency to Radical views sometimes ascribed to him. He has been not only a skilful administrator, but a close student of economic questions. He is a protectionist, though not of the extreme type, and an advocate of economy in finance, having made an able speech on financial reform in 1895. His administration as president has done much to strengthen the Republicans, and the Monarchist party has almost entirely disappeared as a serious factor in national affairs. Among the events of his term were the trial of Captain Dreyfus at Rennes, the strike of the miners at Montceau and of the dock-workers at Marseilles, and the enforcement of the association's law, with the attendant disturbances; but throughout all of these difficulties the government retained general confidence. See France, *History.*

Loudon, low'dŏn, **Fort**, a name given to two forts built during the Colonial period, and intended for defense against the Indians. One built in 1750, was in Loudon County, Tenn., on the Tennessee River. An Indian massacre took place here a few years after the erection of the fort. The other Fort Loudon was erected in 1752, near Winchester, Va. It was a square building with four bastions, mounting 24 guns. It was large enough to accommodate nearly 500 men.

Loughead, lō'hĕd, **Flora Haines**, American novelist and journalist: b. Milwaukee, Wis., 12 July 1855. She was graduated from Lincoln University, and was married in 1875 to C. E. Appony, and in 1886 to John Loughead, a journalist. She has done much journalistic work in Chicago, Denver and San Francisco, and is the author of 'The Libraries of California' (1878); 'The Man Who Was Guilty' (1886); 'Handbook of Natural Science' (1886); 'Quick Cooking' (1890); 'The Abandoned Claim' (1890); 'The Man from Nowhere' (1892); 'Santos's Brother' (1892); 'A Crown of Thorns' (1892); 'The Black Curtain' (1897); 'The San Franciscan'; and of several plays.

Louis, loo'ĭs (Fr. loo-ē), called "The Child," king of Germany: b. 893; d. 911. He was the son of the Emperor Arnulphus, and succeeded him in 899. During his nominal kingship the government was mainly conducted by Archbishop Hatto of Mainz. At this time the empire was constantly ravaged by the Hungarians. He was the last prince in Germany of the Carlovingian race.

Louis I., surnamed Le Debonnaire, Roman emperor: b. 778; d. near Mainz, Germany, 20 June 840. He was a son of Charlemagne, was early appointed by his father King of Aquitania, and in 813 was named joint-regent of France, of which, in the following year, he became sole sovereign, as well as Emperor of the West. In 817 he divided his dominions among his three sons, and thereby gave rise to disturbances and contests which lasted during the whole period of his reign. In 829, in consequence of the solicitations of his second wife, Judith of Bavaria, who had borne him a son, Charles the Bald, he made a new division of the empire. In 830 the brothers Lothair and Pepin combined against their father, took him prisoner, charged their stepmother with adultery, and shut her up in a monastery. The design of Lothair to make himself sole sovereign having been discovered, the diet of Nimeguen obliged him to submit at discretion. Strife continued for the rest of Louis' life. In 837 Louis made a new division in favor of Charles, who obtained Neustria in addition to Aquitania. Though not without good qualities Louis had neither the statesmanship nor decision necessary for ruling so large an empire. He was succeeded as emperor by Lothair, to whose protection he had recommended his favorite son Charles.

Louis II., Roman emperor: b. about 822; d. Brescia 13 Aug. 875. He was the son of Lothair I., was made king of the Lombards in 844, and became emperor, in succession to his father, in 855.

Louis III., Roman emperor: b. about 880; d. about 924. He was the son of Boson, king of Provence, and Ermengarde, daughter of the Emperor Louis II. He succeeded his father on the throne of Provence at the age of 10, and in 900 contested the imperial throne with Berengar I., who, having surprised him at Verona, deprived him of his sight.

Louis IV., surnamed the Bavarian, Roman emperor: b. 1286; d. near Munich 11 Oct. 1347. He was the son of Louis the Severe, Duke of Bavaria, and succeeded his father in the dukedom, and was elected emperor in 1314. Frederick le Bel of Austria was also chosen at Cologne by another party of electors, and a war between the rivals ensued. Frederick was taken prisoner and only gained his liberty by renouncing his claims. Pope John XXII. then, in 1322, issued his bull of deposition against Louis, and the latter, appealing to a general council, went to Italy, where he declared the deposition of John and set up Peter de Corbiere as pope under the name of Nicholas V., by whom he was crowned at Rome. In 1328 the German electoral princes in a council at Rhense announced that the emperor's title to the German and imperial crowns were derived from his election by them and required no further sanction from the pope, the validity of which proceeding was not recognized by the Papacy.

Louis I., king of France. See Louis I., Roman emperor.

Louis II., surnamed Le Bègue (the Stammerer), king of France: b. 846; d. Compiègne, France, 10 April 879. He was the son of Charles the Bald, was crowned King of Aquitaine in 867, and succeeded his father on the throne of France in 877. He was obliged to deliver up Provence to Boson, by whom it was erected into a kingdom. His children, Louis and Carloman, divided the kingdom between themselves and a posthumous son, afterward known as Charles the Simple.

Louis III., king of France: b. about 863; d. 822. He was the son of Louis II., and the brother of Carloman, with whom he divided the rule of the kingdom. He defeated Hugh the Bastard, son of Lothaire, marched against Boson, king of Provence, and successfully opposed the Normans at Saucourt, a battle recounted in the famous German poem, the 'Ludwigslied.'

Louis IV., surnamed D'Outremer, king of France: b. 921; d. September 954. He was the son of Charles the Simple and became king in 936, on the death of Rudolph of Burgundy. He invaded Normandy, but was defeated and taken prisoner in 944. He was set free the next year after being obliged to concede Normandy to Richard, son of Duke William, and Laon to Hugh, father of Hugh Capet.

Louis V., surnamed Le Fainéant (Do Nothing), king of France: b. 966; d. May 987. He was the last French monarch of the Carlovingian dynasty. In spite of the name conferred upon him he was an active ruler. He succeeded his father Lothaire in 986, and soon after becoming king took the city of Rheims and was preparing to march to the assistance of the Count of Barcelona, hard pressed by the Saracens, when he is said to have been poisoned by his queen.

Louis VI., surnamed Le Gros (the Fat), king of France: b. about 1078; d. 1 Aug. 1137. He was the son of Philip I., with whom he was associated in the government in 1100, and whom he succeeded in 1108. His reign was greatly disturbed by contests with the Normans, and by feuds among his vassals. He quarreled with Henry I. of England, and thus was begun the struggle between the English and the French, which continued three centuries. He was ably counseled by his minister, Abbé Suger. Consult: Luchaire, 'Louis VI. le Gros' (1889).

Louis VII., called Le Jeune, king of France: b. about 1120; d. 18 Sept. 1180. He was the son of Louis VI., and succeeded him in 1137. He contested with Pope Innocent II. the right of presentation to benefices, and was excommunicated by Innocent and his kingdom placed under interdict. By the persuasions of St. Bernard, Louis embarked on the Second Crusade, but was defeated by Saladin, and while returning to Europe, was captured at sea by the Greeks, but afterward rescued by Roger, king of Sicily. His divorced queen, Eleanor of Aquitaine, married Henry of Normandy, afterward Henry II. of England, bringing with her as dowry the provinces of Poitou and Guienne. This caused a long war between England and France. Consult: Luchaire, 'Etudes sur les Actes de Louis VII.' (1885); Hirsch, 'Studien zur Geschichte König Ludwigs VII. von Frankreich' (1892).

Louis VIII., surnamed The Lion, king of France: b. 1187; d. Montpensier, Auvergne, France, 8 Nov. 1226. He was the son of Philip Augustus of France and married Blanche of Castile in 1200. Accepting the offer of the English crown made him by the English barons in 1216 he landed in England, took Rochester and Winchester and received the homage of the barons at London. On the death of John he was excommunicated by the legate and withdrew to France in September 1217. He succeeded his father in 1223, and soon regained most of the English possessions in France. In 1226 he led a crusade against Raymond, Count of Toulouse, and the Albigenses; took Avignon after a three months' siege, and laid waste Languedoc. Consult: Petit Dulaillis, 'Etude sur la Vie et la Regne de Louis VIII.' (1894).

Louis IX., called Saint Louis, king of France: b. Poissy, France, 25 April 1214; d. near Tunis, Africa, 25 Aug. 1270. He was the son of Louis VIII. and Blanche of Castile and came to the throne on the death of his father. Being only in his 12th year he was placed under the guardianship of his mother, who was made regent of the kingdom, and was declared of age in 1236. In 1243 Louis defeated the English in several engagements, and a truce for five years was concluded. Having made a vow, in the event of recovering from a dangerous disease, to march against the infidels in the Holy Land, he in 1248 embarked at Aigues-Mortes with an army of 50,000 men. This expedition proved disastrous and Louis with his army was captured by the Saracens. Damietta, which had been taken by the French, was demanded as the price of the monarch's freedom, and a vast ransom was also claimed for his followers. In 1254 he returned home, and in the interval Queen Blanche, who had ruled the kingdom well in his absence, had died. Louis now turned his attention to the administration of the law. The subjects were now suffered to appeal from the decision of their lords to four royal tribunals, and men of learning were introduced into the parliament. Louis also diminished the taxes. The code of laws known as the 'Etablissements de St. Louis' is the work of some unknown compiler. In 1270 he undertook a crusade against Tunis, in the midst of which enterprise he died. He was canonized by Boniface VIII. in 1297, and the Sieur de Joinville wrote his life. Consult: Langlois, ‘Saint Louis’ (1887); Berger, ‘Saint Louis et Innocent IV.’ (1893); Lecoy de la Marche, ‘La France sous Saint Louis’ (1893); Berger, ‘Histoire de Blanche de Castile’ (1895); Sepet, ‘Life’ (1903).

Louis X., surnamed Le Hutin (the Quarreler), king of France: b. Paris 1289; d. Vincennes 4 June 1316. Through his mother he inherited the kingdom of Navarre in 1305, and in 1314 he succeeded Philip the Fair, his father, on the throne of France. His posthumous son, John I., survived but a few months, and Louis' brother then succeeded as Philip V.

Louis XI., king of France: b. Bourges, France, 3 July 1425; d. Plessis-les-Tours, France, 30 Aug. 1483. He was the son of Charles VII., but in all respects very unlike him, and in 1440 he left the court and headed an insurrection against his father. Charles pardoned his son but the latter soon entering into new conspiracies was obliged to take refuge in Burgundy, and lived there five years in a dependent condition. On reaching the throne after the death of his father, in 1461, he dismissed the former ministers and surrounded himself with obscure men, having neither character nor talents to recommend them. In all his acts a crooked policy and sinister views were evident. Pretending to reconcile contending parties, he secretly instigated them against each other, and when negotiating with a foreign government he bribed its messengers and established secret correspondences with them. He carried on a war with Charles the Bold, Duke of Burgundy, which lasted 1465–72, and on the death of Charles in 1477 at the battle of Nancy, he joined Burgundy to France. In 1481 he united Anjou, Maine and Provence to the kingdom. Consult: See, ‘Louis XI. et les Villes’ (1893); Kitchin, ‘History of France,’ Vol. I. (1885).

Louis XII., surnamed the Father of His People, king of France: b. Blois, France, 27 June 1462; d. 1 Jan. 1515. He was the son of Charles, Duke of Orleans, and on coming to the throne in 1498 he pardoned all who had wronged him previously. His reign was continually disturbed by war. He subdued the Milanese, Genoa, and Naples; but in 1513 the French were expelled from Italy. Henry VIII. of England, attacking Louis in his own dominion, Louis was obliged to sue for peace after the Battle of the Spurs in August 1513. For his third wife he married the young Princess Mary, sister of Henry VIII., who after his death was married to her first lover, Charles Brandon, Duke of Suffolk. Louis XII. was honest and magnanimous; he was friendly to science, and France prospered under him. Consult: Lacroix, ‘Louis XII. et Anne de Bretagne’ (1882); Claviere, ‘Histoire de Louis XII.’ (1890 et seq.).

Louis XIII., king of France: b. Fontainebleau, France, 27 Sept. 1601; d. Saint Germain-en-Laye, France, 14 May 1642. He was the son of Henry IV., whom he succeeded under the regency of his mother, Mary de Medicis. In 1614 he was declared of age and the next year he married Anne of Austria. The realm was now in a very disturbed state. The Huguenots were threatening and a great part of the kingdom rebelled. In 1624 Louis chose Cardinal Richelieu as his prime minister, and the remainder of his reign was to all purposes that of the great cardinal. Under him the Huguenot power was broken, politically, the governmental power centralized and the influence of Austria materially weakened. Consult: Raumer, ‘Geschichte Ludwigs XIII. und des Kardinals Richelieu’ (1830); Topin, ‘Louis XIII. et Richelieu’ (1876); Zeller, ‘La Minorité de Louis XIII.’ (1897). See Richelieu.

Louis XIV., king of France: b. Saint Germain-en-Laye 5 Sept. 1638; d. Versailles 1 Sept. 1715. He was only 5 years old when he succeeded to the throne, but his mother, Anne of Austria, was made regent during his nonage which ended in 1651, when he was 13. Cardinal Mazarin was then prime minister and the French army under the leadership of Condé and Turenne was gaining much glory in the war with Spain and the emperor. But internally the nation was in the throes of a civil war; Mazarin's avarice and the peculations of Fouquet had disgusted the Parisians, who were moreover incensed with Anne of Austria's conduct of the regency and the supremacy of her agent the cardinal. The king and his mother were compelled with the unpopular prime minister to flee from the capital, and the Spanish armies streamed over the northeast boundaries from Holland and held their way victoriously through Champagne and Lorraine. When war broke out between England and Holland Louis threw his strength on the side of the latter; but the conflict was largely confined to the sea, and after a few sea fights the war was ended by the Peace of Breda in 1667. Mazarin had died in 1661, Fouquet was condemned to perpetual imprisonment after being compelled to disgorge his ill-gotten gain, and when the king was asked who was to be referred to on matters of public business he astonished his courtiers by saying «Myself.» And indeed he reigned as absolute monarch to the end of his days. He appointed Colbert to take charge of the public exchequer, and the consequence was a multitude of needed reforms. He had forced the court of Spain as well as Pope Alexander VII. to submit to his personal dictation and make ample reparation for the wrongs suffered by French ambassadors at the hands of Spaniards and Italians in foreign capitals. All Europe was impressed by his bold self-assertion, and his well-known saying «*L'état c'est moi*,» «I am the state,» was felt to be literally true. But his great desire was the attainment of military glory. When a child his chief amusement had been to turn his playmates into soldiers and engage in a mimic war. After his victorious campaign in Holland, closed by the Treaty of Nimeguen in 1678, he was acknowledged to be the leading sovereign in Europe. He had the most numerous, the best drilled, the best equipped army in the world. His diplomacy had triumphed in every court, and the French nation led Europe in art, science and letters, while trade and industry were amazingly flourishing. Louis shone among his ministers, generals and literary courtiers as the sun among the stars, an ideal king, a paragon of learning, strength and wisdom. At Versailles he built himself a palace at a cost of 150,000,000 francs. Here the splendor of his surroundings was the envy and admiration of all other monarchs, great and small. But his wisdom and political sagacity were much criticised when in 1685 he revoked the Edict of Nantes by which the policy of Henry IV. had made certain indulgences to Calvinists of France. By unsheathing the sword of religious persecution he drove away many citizens whose industrial skill and steady lives formed one of the stablest and most precious elements in French national life. Soon after this half of Europe formed a league against France. Holland, Germany and Spain joined their forces in an attempt to humble the overweening arrogance of a monarchy whose greatness was a menace to each of them. In 1688 the dauphin took Philipsburg on the Rhine, but was forced to evacuate and retreat before the overwhelming forces of the allies. The war continued with varied fortunes until the peace of Ryswick, 1697. The death of Charles II. of Spain, the last of the house of Hapsburg (1700), brought on the war of the Spanish Succession. He left his crown to Philip of France, Duke of Anjou, who assumed the title of Philip V., but his claim was disputed by the Archduke Charles, who had the support of the emperor, as well as of Holland and England. In 1704 Prince Eugene and Marlborough routed the French forces at Blenheim, Barcelona surrendered to the Archduke Charles, Marlborough won the battle of Ramillies and in 1708 that of Oudenarde. The fatal defeat of Malplaquet the following year decided the struggle in favor of the allies and the Peace of Utrecht (1713) completed the humiliation of France and added to the power and ascendancy of England. France was, however, saved from dismemberment, mainly through the boldness and vigor of Louis and his counsellors, and the principal foreign conquests of the king were not forfeited. For the two remaining years of his reign the country enjoyed tranquillity. Louis in his declining years expressed regret for the distress he had brought on his well-loved country by his love of foreign conquest and warlike glory. His unworthy private life had some part in rousing the remorse which tortured his last days, and caused him to show that spirit of piety and devotion which Lesage ridiculed as hypocrisy. His mistresses, La Vallière, Montespan, Fontanges, and others had made his court a by-word of scandal. Madame de Maintenon, who was married to him a year after the death of his queen Maria Theresa (1683), was influential in rousing his sense of past licentiousness. In this she was aided by the eloquence of Bossuet.

The reign of Louis le Grand was made brilliant by the great soldiers, sailors, literary men, artists, and men of science who were his contemporaries. His reign has indeed been aptly styled the Augustan or golden age of France. Among his sea commanders were Château-Renand, Duquesne, and Tourville; Vauban was his military engineer; Perault, Mansart and Blondel architects; among his painters were Claude Lorraine, Poussin and Lebrun; among poets and writers of his reign were Corneille, Racine, Molière, among his great preachers were Massillon, Bossuet and Flechier. He was worthy of the title of the Great Monarch for his strong and astute statecraft, the magnificence of his court, his dignity and munificence, and he fixed for the French monarchy that type of absolutism which Balzac has declared to be in France the safest and best foundation on which national greatness was to be developed.

Consult: Voltaire, 'Siècle de Louis XIV.'; Hassall, 'Louis XIV. and the Zenith of the French Monarchy' (1895); and Philippson, 'Das Zeitalter Ludwigs des Vierzehnten' (1879).

Louis XV., king of France: b. Versailles, France, 15 Feb. 1710; d. there 10 May 1774. He was the great-grandson and successor of Louis XIV., and coming to the throne when only five years old, Philip, Duke of Orleans, was made regent. Louis was declared of age in 1723 and married Marie Leczinska, daughter of the king of Poland. The Duke of Orleans died that year and was succeeded as prime minister by the Duke of Bourbon, who was removed in 1725 to make way for Cardinal Fleury, who died in 1743. After the Cardinal's death the king's mistresses, Pompadour and Du Barry, controlled the election of the prime minister and other officers. In 1741 France became entangled in the war of the Austrian Succession against Austria but in 1756 was involved in the Seven Years' war, in which Austria was the ally of France. This was ended by the Peace of Paris in 1763. By this treaty Louisiana and Canada were lost to France. The kingdom was left impoverished at the death of Louis, partly by war and partly through the enormous sums squandered upon the royal mistresses. Consult: De Tocqueville, 'Histoire philosophique du Regne de Louis XV.' (1846).

Louis XVI., king of France: b. Versailles 23 Aug. 1754; d. Paris 21 June 1793. He was the third son of Louis and of Marie Josepha, daughter of Frederic Augustus, king of Poland and elector of Saxony. During the lifetime of Louis XV. he bore the title of Duke of Berri. Amid the corruptions of the French court he kept aloof from licentiousness, was reserved and taciturn, and took most delight in practising some mechanical art, such as lock-making or printing. In 1770 he was married to Marie Antoinette, archduchess of Austria, and four years later became a king by the death of his grandfather. He began his reign with many popular measures tending to alleviate the financial distress under which the country labored, and his appointment of Turgot as minister of finance gave general satisfaction. The people were moreover pleased to see the parliaments again convened (1774), and the king set an example of national economy and retrenchment by the simplicity of his personal life, and the reduction of his retinue. The war of the American Revolution had sent Franklin and Deane to Paris to ask help for the young republic. Louis XVI. was weak enough to take sides with the English colonists against their mother country, and the French and English war cost France an amount of treasure that almost plunged her into bankruptcy. At the same time French enthusiasm, roused in favor of republicanism, caused a feeling to prevail which threatened to endanger the stability of the monarchy. Necker by his attempts at reform and economy so offended the nobility that he was compelled to resign and was succeeded by the reckless and wasteful Calonne. The queen was meanwhile very unpopular, and the affair of the «Diamond Necklace» (q.v.) was made to aggravate public disaffection toward the throne. The notables met in 1787, but rejected a measure for universal taxation which would comprise the notables and clergy of the realm. Calonne, the finance minister, resigned, bankruptcy menaced the nation and Necker was recalled, and suggested the convening of the States-General. The assembly met amid great popular excitement in May, 1789, at Versailles, a series of reforms in public expenditure was begun, and the country was filled with enthusiasm. Necker sought to reproduce on French soil the limited monarchy of Great Britain. Louis proposed concessions, which were coldly greeted, and when he dissolved the assembly, Mirabeau, who sat in the third estate, defied the royal power, and refused, in the name of the people, to obey the mandate of dissolution. So great meanwhile was the excitement and anxiety which reigned in Paris that a national guard was formed with Lafayette for a commander. The king vacillated, dismissed Necker, surrounded Paris with his army and the people rose in a burst of frenzy and sacked the Bastile. The king ordered the approach of the troops on Paris, but to conciliate the people appeared at Hotel de Ville wearing the tricolor. Meanwhile the princes of the blood and the nobles were leaving the country, Necker was recalled, and the king returned to Versailles, but on 5 October the mob took possession of the royal palace there, and compelled the king and the royal family to return with them to Paris, where they were kept strictly guarded in the Tuileries. There they were confined as prisoners till the following year (1790). Necker had fled to Switzerland, Mirabeau, the one hope of the monarchy, had died. The king made an attempt to visit St. Cloud (1791) but was prevented by the mob. He then escaped unnoticed from the Tuileries, but was stopped at Varennes, 150 miles from Paris. The invasion of France by the Prussians and Austrians roused the Parisians to fury. They stormed the Tuileries and massacred the Swiss guard; the royal family were flung into the ancient fortress known as the Temple. The national convention met on 20 September; in December they brought the king to trial on a charge of conspiring to overthrow the constitution and restore the ancient order of things. He was condemned by unanimous vote 5 Jan. 1793 and was guillotined. Consult Bouvet, ‘Histoire de Louis XVI.’ (1825); Jobez, ‘La France sous Louis XVI.’ (1877–93); Beaucourt, ‘Captivité et derniers Moments de Louis XVI.’ (1892); Courian, ‘Louis XVI. et la Révolution’ (1893).

Louis XVII., titular king of France: b. Versailles 27 March 1785; d. Paris 8 June 1795. He was the second son of Louis XVI. and Marie Antoinette; was at first styled Duc de Normandie; and after the death of his elder brother, in 1789, became heir to the throne. With his relatives, in 1792, he was imprisoned in the Temple; after his father's death in the following year was styled king by the Royalists; but being given into the keeping of a shoemaker named Simon, in derision called his tutor, was subjected to brutal treatment, from which he died. The fact of his death was denied by certain impostors, whose claims to his name and to the throne found some supporters. Such claims continued to be urged almost down to the middle of the 19th century, about which time Eleazar Williams (q.v.) a half-breed Indian missionary, born in the State of New York, was led to believe that he was the lost dauphin, he and his friends declaring that he had been delivered from prison and while still very young brought to this country. He died in 1858. Although Williams made little attempt to enforce his own claim, others argued it, and a book was written in its support. But nothing in the nature of historical proof has been esablished to cast doubt on the actual death of the dauphin as above related. Consult: Hanson, ‘The Lost Prince’ (1854); Bülau, ‘Geheime Geschichten und rätselhafte Menschen,’ Vol. II. (2d ed. Leipsic 1863); Evans, ‘The Story of Louis XVII. of France’ (1893); Chantelauze, ‘Louis XVII., son Enfance, sa Prison, et sa Mort au Temple’ (1895).

Louis XVIII., «Stanislaus Xavier» (given the title of Le Desiré, by the Chamber of Deputies), king of France: b. Versailles, France, 17 Nov. 1755; d. Paris 16 Sept. 1824. As the younger brother of Louis XVI. he was designated Monsieur, his rank in the nobility being Count of Provence. He early showed himself a political marplot, a hinderer of reform, and one of the great obstacles to his brother's success in handling the difficulties of the revolutionary movement. When the king escaped from the guards of the Tuileries (1791), Monsieur was by his side, and while Louis XVI. was seized and taken back to confinement, escaped to the frontier. With his brother, the Count d'Artois, he held court for some time at Coblentz, where he issued animadversions on the revolutionists in France, and seriously complicated the difficulties of the royalist cause by his want of temper and judgment. When the Duke of Brunswick invaded France, Monsieur and the Count d'Artois joined his forces and shared his disasters. On the death of Louis XVI. (1793) the Count of Provence declared his nephew king, and when Louis XVII. died (1795) he took the title of king of France. He wandered from court to court of Europe, and finally settled in England (1807), where he remained until the fall of Napoleon. At last he crossed the Channel and entered Paris (3 May 1814) after an absence of twenty-three years. His reign was inaugurated with the bitter retaliatory measures of the White Terror (q.v.). When Napoleon made his escape from Elba and arrived at Paris (1 March 1815) the unpopularity of the Bourbon restoration was proved by the enthusiasm and devotion of those who flocked to his standard. The king fled from Paris, but, after the battle of Waterloo, was once more restored, entered the capital under the protection of victorious Wellington, and appointed a new ministry with Talleyrand at the head of it. Louis proceeded to disband the army, to exclude from the general amnesty those who came under the head of «rebels,» those who had voted for the death of Louis XVI. and were consequently «regicides,» and those who had received rank and honors from Napoleon in 1815. The rest of his reign was satisfactory neither to Blues nor Reds, and the real stay of the country was the Duc de Richelieu, the successor of Talleyrand. In accordance with the policy of the Holy Alliance the despotic Ferdinand VII. was re-established on the Spanish throne by a French army (1823) and the last year of the king's life was spent in disease, followed by paralysis, which carried off a feeble and illiberal monarch whose only work in life had been to prove that political disquiet in France had not been and was not to be allayed, by the restoration of the Bourbons. Consult Dulaure and Anguis, ‘Histoire de la Révolution depuis 1814 jusqu'à 1830’ (1834–8); Viel Castel, ‘Histoire de la Restauration’ (1860 et seq.).

Louis Philippe, fē-lēp, king of the French: b. Paris 6 Oct. 1773; d. Claremont, near Windsor, England, 26 Aug. 1850. He was the eldest son of Duke Louis Philippe Joseph of Orleans, afterward surnamed Egalité, and of the Princess Louise Marie Adelaide of Penthièvre. In infancy he held the title of Duke of Valois, and in 1785 that of Duke of Chartres. In 1782 his father entrusted the education of Louis Philippe and his other children to Madame de Genlis. Having entered the national guard in 1790, he became a member of the Jacobin Club. In May 1792 he commanded a brigade of cavalry in Luckner's army, rose under Kellerman in September to be lieutenant-general, and did good service in the famous cannonade at Valmy. He next joined the army of Dumouriez, and took part in the victory of Jamappes. Dumouriez had formed a scheme for placing him on the constitutional throne, and being included in the order of arrest directed against Dumouriez, in April 1793 he took refuge within the Austrian territory. After many wanderings he procured the situation of teacher of geography and mathematics in the school of Reichenau, near Coire, where, during eight months, he passed under the name of Chabaud-Latour. In 1796 Louis Philippe, since his father's death, Duke of Orleans, arrived in America, where, in the following year, he was joined by his two younger brothers. The three princes traveled in the United States, and at last took ship for England, where they landed in 1800. The brothers lived above seven years at Twickenham, near London. After the news of Napoleon's downfall the Duke of Orleans set out for Paris, where he was received by Louis XVIII., not without distrust, and in 1814 appointed colonel of hussars. On the news of Napoleon's return he set out for Lyons to assist the operations of the Count d'Artois. After an unsuccessful attempt to hold the northern departments for the Bourbons, he left Lille and set out for England to join his family, who had preceded him. He returned in July 1815 and obtained the removal of the sequestration of his domains which had been imposed by the imperial government. The estrangement of Louis XVIII. from him was, however, increased, and he withdrew in October 1815 to England, but returned to Paris in the following year. After the coronation of Charles X. his relation to the court became more friendly. During the bloody days of 27, 28 and 29 July, the court had entirely forgotten him. Nor during the struggle was his name mentioned in Paris. On the 29th the provisional chamber, on Laffitte's suggestion, resolved to offer him the regency as lieutenant-general of the kingdom. In a sitting of the chamber on 9 August he swore to the reform charter, and ascended the throne as king of the French. Being hated by the extreme Democrats, frequent attempts were made on his life; but during this period France made vast progress in industry and wealth, and the durability of the July throne seemed to be thereby consolidated. But his selfish policy had estranged the European courts, and a loud demand for a change in the electoral system being foolishly opposed by the king and the Guizot ministry, his position in France became extremely precarious. On 22 Feb. 1848 an insurrection began in the streets of Paris. Next day Guizot gave in his resignation; but the insurrection gained in extent and intensity, and neither the command given to the troops on the morning of the 24th to stop firing, nor the abdication of the king a few hours after in favor of his grandson, the Count of Paris, sufficed to lay the storm. Louis Philippe, completely disheartened, unsupported by any administration, and forsaken even by the courtiers, about midnight of 24 February quitted the Tuileries with his family, and fled from Paris, and on 3 March 1848 took up his residence in England, which he never again left.

Louis D'Or, loo'ē dôr (Fr. «golden Louis»), a gold coin formerly current in France. It was first struck in consequence of an edict of Louis XIII. dated 31 March 1640. It was 22 carats fine, and originally was worth 10 livres of the period (equal to 21 francs 33 centimes). Afterward it ranged in value from about $4 to $4.60. In 1810 the louis d'or was replaced by the napoleon of 20 francs, and when the coin was again struck under the restoration the same value (20 francs) was retained.

Louisa, loo-ē'za, queen of Prussia. See LUISE, AUGUSTE WILHELMINE AMALIE, QUEEN OF PRUSSIA.

Louisburg, loo'is-berg or loo'ē-berg, town of Cape Breton Island in the Province of Nova Scotia; on the coast at the entrance to the Gulf of Saint Lawrence. The earliest mention of English Harbor later called Louisburg is found on Champlain's Map of 1612 and was, in his time, the resort of fishermen mainly from England. It was not until 1713 that Louisburg came into prominence by the removal to it of the French officers and inhabitants from Newfoundland then ceded to England under the Treaty of Utrecht.

The city is chiefly noted for the historical events which transpired in and around it and for the ruins of the fortifications. These fortifications were commenced in 1720 and completed about the year 1744 at a cost to the French Government of 30 millions of livres equal to-day to about 10 millions of dollars. They enclosed an area of about 100 acres and had a circumference of 2½ miles.

On the declaration of war in March 1744 between France and England, Louisburg was the object of an attack by the expedition sent out by the New England Colonies. This was composed of 3,250 men from Massachusetts, 300 from Connecticut, 300 from New Hampshire, and 150 from Rhode Island, supplemented by 14 vessels, carrying 200 guns fitted out by the Provinces, and by Commodore Warren's West Indian fleet of 10 vessels carrying 460 guns beside the captured Vigilante of 64 guns. The siege, begun on 30 April 1745, ended in the capitulation by Governor Duchambon on 16 June.

By the Treaty of Aix-la-Chapelle in 1748, the Island of Cape Breton was restored to France in 1749, and the fortifications at Louisburg were considerably strengthened and a new battery erected at Point Rocheforth at a cost of $5,000,000. In February 1758, two years after war had been declared between France and England, a second expedition, consisting of 22 ships of the line, 16 frigates and 120 transports with 11,000 troops, invested the fortifications and on 27 July the troops under General Wolfe entered the fortress. Thus Louisburg became a possession that settled for all time the future of Canada.

Shortly after the capture the British Government ordered that the great fortress be razed to the ground and to-day only the casements or bomb-proofs remain. The ruins are now being preserved and under the patronage of King Edward VII a memorial tower is to be erected bearing the names of the killed and wounded in both sieges.

Louisburg is now becoming a port of considerable importance, having been established as the eastern terminal port of the Intercolonial railway and used by the Dominion Coal Company and by the Dominion Steel Company as a shipping port for a large portion of their products. See Colonial Wars in America.

Louiseville, loo'ĕz-vĭl, or **Rivière du Loup,** rē-vē-ā dü loo, Canada, town, capital of Maskinongé County, in the province of Quebec; on Lake Saint Peter, an expansion of the Saint Lawrence River; and on the Canadian Pacific railroad; about 18 miles west of Three Rivers. The mineral springs of Saint Léon, in the vicinity, bring many people to Louiseville. The chief industry is tanning leather, but flour and dairy products are among the manufactures. Pop. (1901) 1,055.

Louisiade (loo-ē-zē-äd) **Archipelago,** in the Coral Sea, southeast of New Guinea; belongs, administratively, to British New Guinea. The largest islands of the group are Southeast (Sudest) Island, Saint Aignan, and Rossel. Southeast Island is about 45 miles long and from 4 to 10 miles wide. Rossel and Saint Aignan each have an area of over 100 square miles. They are all mountainous. Saint Aignan has a peak about 3,500 feet in height. Many of the small islands are of coral formation; and the vegetation is varied and luxuriant. The islands were discovered in 1666 by Torres, and became British possessions in 1888. The majority of the inhabitants are uncivilized, and are of the Papuan race.

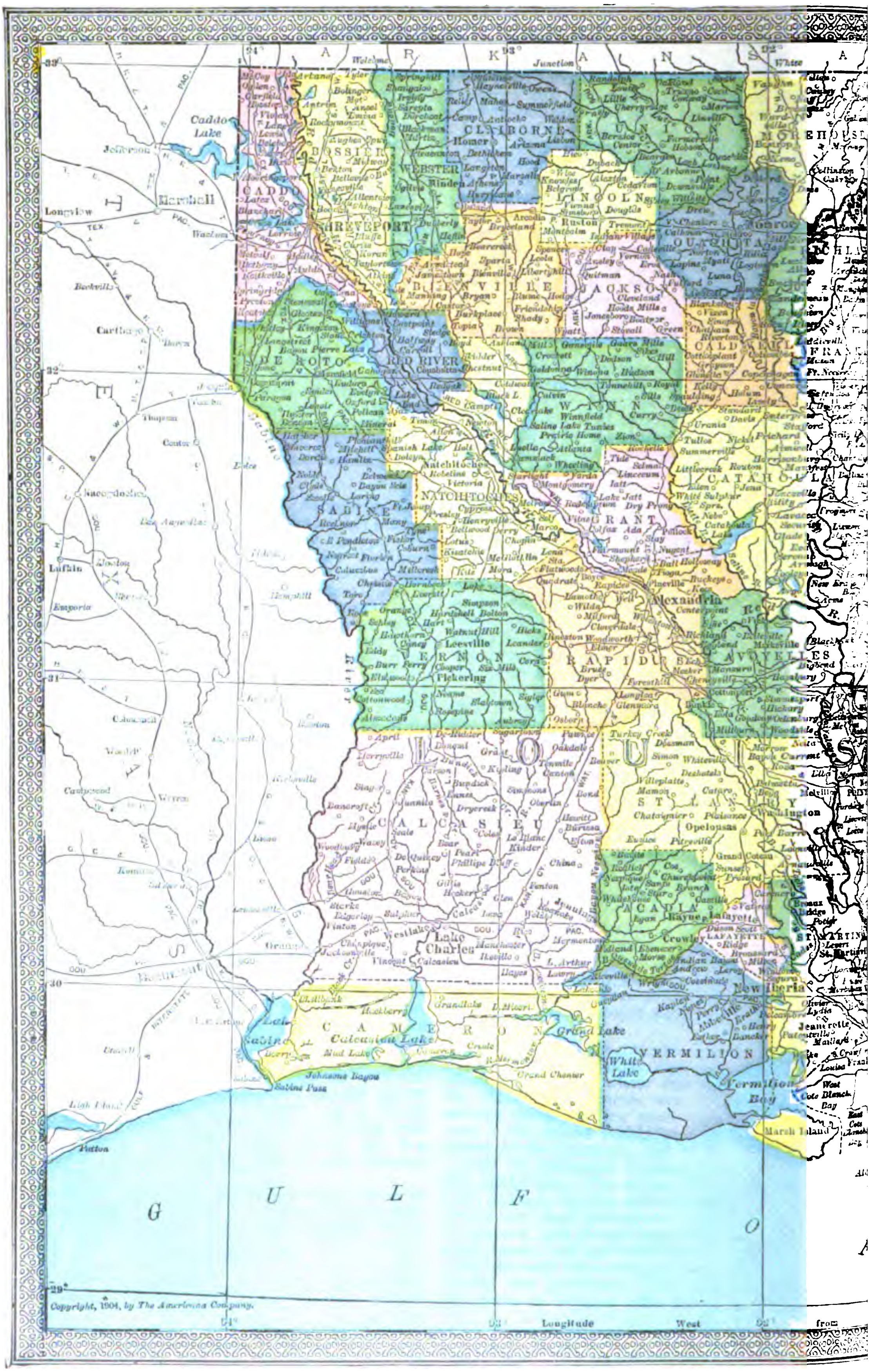
Louisiana, one of the United States, bordering on the Gulf of Mexico; one of the largest and most important of the Southern States. The name «Louisiana» was first applied by La Salle in 1683 to the vast territory watered by the Mississippi and its tributaries, which he thus dedicated to King Louis XIV.

It was the fifth State admitted to the Union under the Federal Constitution. It lies between lat. 28° 59′ and 33° N., and lon. 88° 40′ and 94° W. Its extreme length is 300 miles, and extreme width 240 miles, with an area of 41,346 square miles. It is bounded on the north by Arkansas on parallel of 33° to the Mississippi and thence on the parallel of 31° to eastward Pearl River, on south by the Gulf of Mexico, on the west by the Sabine River and a line drawn from it directly north to meet the 33° parallel. Within these limits are included 445,420 square miles of land and 3,300 of water, 540 in rivers and 2,760 in lakes. The State is divided into 59 parishes gradually created from the five original divisions under French and Spanish domination.

Rivers and Lakes.—The Mississippi River in its devious course splits Louisiana in twain with 37,000 square miles on the western bank. With but rare interruptions the river flows through alluvial soils of low elevation requiring the protection of levees. The coast line of the delta and eastward consists of lands little above sea level intersected by small tracts of elevated prairies and low ridges covered with live oak. Northwestward the land rises until in north Louisiana the hills attain the height of 500 feet. Both on the Mississippi and the other river valleys, the highest land is formed by the banks themselves, from which the land slopes away gradually to the marshes. To protect these low-lying lands there have been built at vast expense some 1,500 miles of levees of great strength. These, however, give way occasionally before the mass of waters brought down by the Mississippi in flood, and great damage results. (See Levee.) The drainage system of the State is toward the Gulf and mainly through the Mississippi and its tributaries, the Red River and the Ouachita. On the east Pearl River and on the west the Calcasieu River and the Sabine, which divides Louisiana from Texas — each drain small districts. The Red River formerly flowed directly to the Gulf of Mexico. Its old channel is now filled by the Atchafalaya, which has increased so rapidly of late years as to give rise to fears of its becoming the main channel of the Mississippi. The lakes of Louisiana are of three kinds. Those on the coast are shallow estuaries enclosed within the delta, of which the greatest are lakes Pontchartrain and Maurepas. At the entrance to the former is Lake Borgne. A second class is formed by the curved sections of the river which are cut off and silted up as in the smaller rivers by the action of accumulated debris and rafts of driftwood such as are found above Shreveport. These are rapidly disappearing through the removal of the obstructions, and the lands are being reclaimed.

Of the 28,000,000 acres of land in the State only 3,000,000 are in cultivation. Nearly the entire upland is covered by strata of drift or red sandy clays. One thousand nine hundred square miles are alluvial. The soil next the river is the lightest or soundest, the surface of the backlands consists of a peculiarly friable soil known as buckshot to such a depth as to permit of the deepest cultivation and with a high absorptive power which secures crops against drought. South of the Red River the soils are less varied in character, but all are rich in the essential elements of plant food and require only drainage and good culture to produce excellent crops. The land is distributed as follows: Alluvial lands, 13,225 square miles; bluff prairies, 5,739 square miles; oak uplands, 8,103 square miles; long-leaf pine hills, 7,582 square miles; long-leaf pine flats, 2,556 square miles; central prairies, 785 square miles; coast marshes, 7,420 square miles.

Geology and Mineralogy.—The entire State is part of the Mississippi deposit on the bottom of an ancient gulf whose shore touched Cairo, Ill. Its oldest sediments were Cretaceous, now covered except in a few small spots in the northwest. The upland region west of the northern course of the Calcasieu, and of the Washita, is a mass of horizontal Tertiary beds, clays, and clay sandstones. The entire alluvial region and coast swamps, besides much bordering prairie, is Quaternary. Such formations could hardly be rich in minerals, and though some iron ore and low-grade brown coal are found in the Tertiary districts, the only important minerals are rock salt, sulphur and petroleum. The salt is found in the chain of isolated hills known as Islands,



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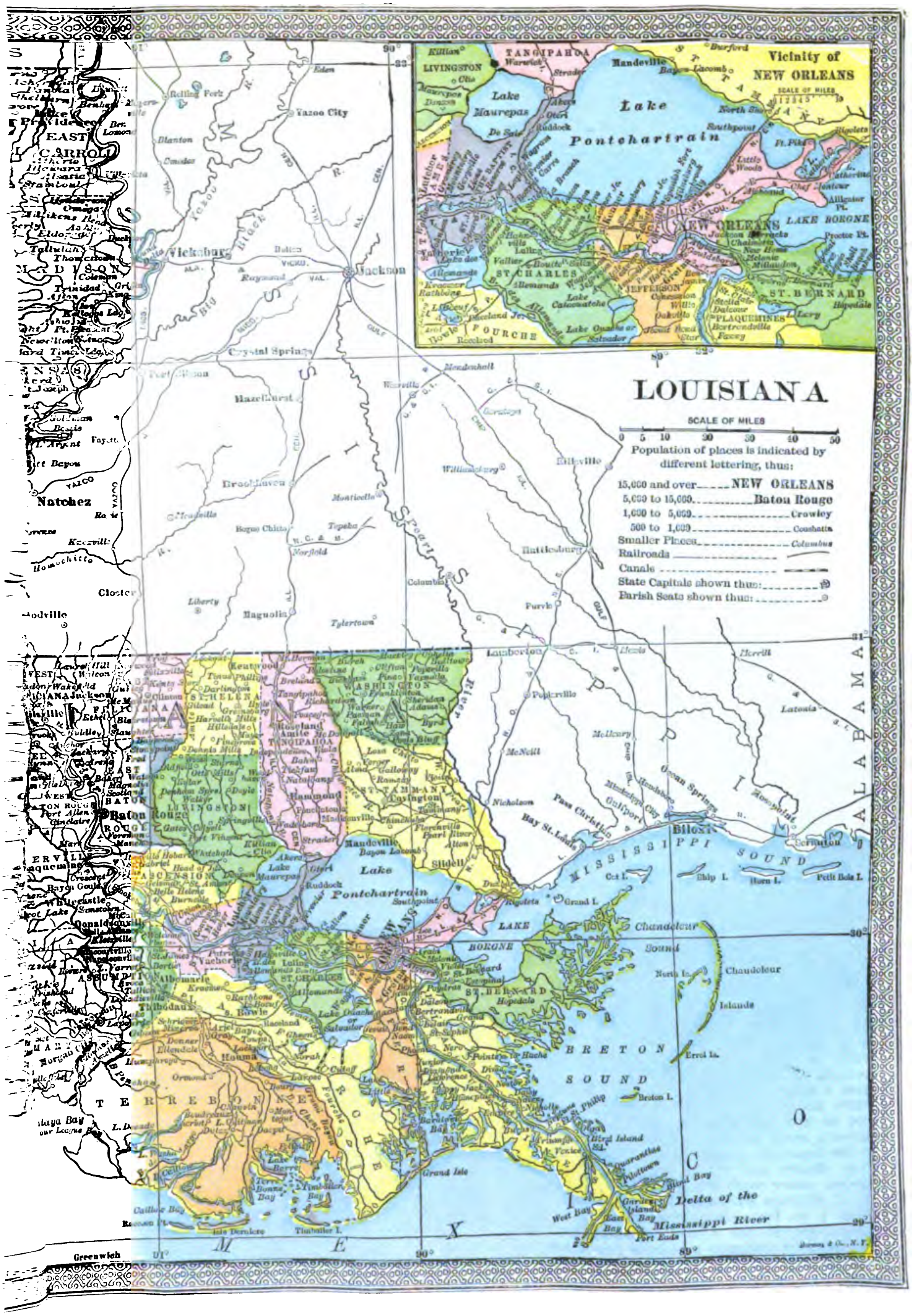
LOUISIANA
SCALE OF MILES
0 5 10 20 30 40 50
Population of places is indicated by different lettering, thus:
15,000 and over NEW ORLEANS
5,000 to 15,000 Baton Rouge
1,000 to 5,000 Crowley
500 to 1,000 Coushatta
Smaller Places Columbus
Railroads
Canals
State Capitals shown thus:
Parish Seats shown thus:
Vicinity of NEW ORLEANS
SCALE OF MILES
Lake Pontchartrain
Lake Maurepas
LAKE BORGNE
NEW ORLEANS
ST. CHARLES
JEFFERSON
ST. BERNARD
PLAQUEMINES
TANGIPAHOA
LIVINGSTON
Mandeville
Vicksburg
Jackson
Yazoo City
Crystal Springs
Hazlehurst
Brookhaven
Hattiesburg
Columbia
Magnolia
Liberty
Gulfport
Biloxi
Bay St. Louis
Pass Christian
Ocean Springs
MISSISSIPPI SOUND
ALABAMA
Baton Rouge
Donaldsonville
Thibodaux
Houma
Hammond
Covington
Slidell
TERREBONNE
LAFOURCHE
ST. TAMMANY
WASHINGTON
ST. HELENA
EAST FELICIANA
BRETON SOUND
Chandeleur Sound
Chandeleur Islands
Grand Isle
Isle Derniere
Timbalier I.
Delta of the Mississippi River
Port Eads
Pearl River
Natchez
EAST CARROLL
MADISON
Greenwich
GULF OF MEXICO
90°
89°
91°
31°
30°
29°
32°

commencing with Petite Anse on the Gulf, and extending to New Iberia. The first workings were at Avery's Island; recently two other mines have been opened and the output will be largely increased. The oil fields in Calcasieu and Saint Martin's parishes give promise of exceeding those of Texas in extent and value of product. The sulphur is also in Calcasieu Parish.

Climate and Rainfall.— Louisiana, ranging from the parallel of lat. 33° to 29° N. is semi-tropical in climate and products. The summer heat reaches 105, and averages 85 for the hottest month; it does not reach zero south of Shreveport, and the coldest month ranges on an average from 45° to 60°, according to location. The gulf vapors make it very equable, the prevailing winds being south and southwest,— that is, from the ocean. There are only three months of frost in the year, the beginning varying from the first of November to the first of December. The rainfall varies from an average of 60 inches a year in the southeastern part, to 50 in the northern. This abundant moisture and the steady warmth cover the State with luxuriant tropical growths, and the magnificent profusion and beauty of its flowers are famous. The magnolia is most familiar as a specially southern product, but the roses, jasmines, oleanders, camellias, etc., are notably beautiful. The orange, fig, and most other semi-tropical fruits will flourish here.

Fauna.— The only large quadrupeds surviving are black bears and a few catamounts in the less accessible forests and swamps. Many deer are found during the winter. The wildcat is not uncommon, and the raccoon and opossum are familiar. The alligator is common to all bayous and ponds. Bird-life is plentiful; it comprises eagles and vultures, pelicans and cranes, beside wild turkeys, geese, and ducks. There is an excellent State game law.

Forestry.—A large proportion of the entire forest wealth of the United States is represented by the immense areas of long- and short-leaf pine. It is estimated that there are standing respectively 26,588 millions of long-leaf pine and 21,628 millions of short-leaf pine, occupying 15,000 square miles of upland. In the swamps are vast forests of red and white cypress, the value of which has only recently been recognized. Other valuable woods which are to be found in large quantities on the bluff lands and inland streams are ash, oak, beech, walnut, and cotton wood.

Agriculture.— From the considerations mentioned, an exceptionally fertile soil, a warm climate with variations from northern highlands to southern coast plains, Louisiana has remarkable natural advantages for a great variety of products, from temperate to semi-tropic. Yet less than two fifths of the soil in 1900 was even nominally in farms, and less than one sixth improved; and of the total of $61,272,676 in value of farm crops, $56,395,227, or over eleven twelfths, was in two money crops and two food crops, cotton and sugarcane, corn and rice. This lack of diversification of crops is largely a result of the old slave system, which tended to concentrate attention upon a few staples roughly cultivable by gangs; and the break-up of the system added new difficulties to the old industries for many years without any tendency to create new especially as the land had been exhausted by wasteful cultivation and lack of fertilizing. There are some indications of a change; but the chief feature has been the enormous development of irrigated rice culture, as told below. There has also been a progressive subdivision of farms; the average plantation of 1860 was over 500 acres, the average farm of 1900 was under 100. This does not, however, imply the cessation of large farms; on the contrary, Louisiana is emphatically the State of great plantations outside the ranching States, there being in 1900 over 1,1000 containing more than 1,000 acres each. This is due to the heavy capital needed to carry on the sugar business, which must have a large territory to make fair returns. One result of the growth of the class of colored farmers, besides the cutting up of farms,— their average being 40 acres to 150 for the white farmer,— is the increase of rentals, they being usually too poor and unthrifty to buy. They slightly outnumber the white farmers, but they own only about one seventh of their farms against nearly two thirds owned by the whites, and there are nearly three times as many cash tenants and two and a half times as many share tenants as white. They operate but about one fifth of the farm area, however. In cotton culture, Louisiana has been slower to recover from the Civil War than any other State, having not yet reached the figures of 1860, while several others have immeasurably surpassed them, and it has not greatly grown since 1890. Its product in 1899, though exceeded by six other States, was 44 per cent of the total crop production, being 709,041 bales, valued at $27,004,812. The crop of 1902-3 was 884,000 bales of an average value of $44.52 per bale. Sugar, the next crop in value ($14,627,282), is Louisiana's great specialty; it produces three fourths of all the cane grown in the United States, outside of Hawaii, and more than 11 times as much as the next heaviest producer, Georgia. This is an extensive crop, concentrating a great value on a small area; while the value of the crop was over half that of cotton, its acreage was only one fifth as much; with nearly one fourth the total value of farm products, it occupied only 8 per cent of the farm acreage. One of the great drawbacks to Louisiana sugarcane raising, is that about one fifth has to be kept for seed, and cannot be replaced in the same season, while in Cuba the tops of unfit canes are simply dropped into hoe-made holes, and there are plenty always to be had; the Louisiana seed cane often rots, the Cuban never. The Cuban cane is also much richer in sugar, and the yield per acre is about double. From all these causes, the cost of making a pound of sugar is about double in Louisiana what it is in Cuba. Corn, as in all the Southern States,— owing to its value as a food crop, for feeding swine, and in some States for distilling,— has always had far greater attention than any other cereal; in 1900 it was nearly three fourths of the entire cereal crop, valued at $10,327,723, and increased over 60 per cent in the next decade. But the great coming food crop is rice, whose culture increased about two and a half times in the last decade, and nearly all of this in the last three years; owing to the introduction of improved methods by a quantity of Iowa immigrants, and of a new system of irrigation, which has revolutionized rice culture and worked a complete transformation in the great coast-prairie belt of southwestern Louisiana, and southeastern Texas, formerly almost in primitive solitude. Up to 1897 nearly all the rice grown on these prairies was «Providence» rice, dependent mainly on rainfall. Then two years of drought showed that there was no security without irrigation, and there was a stampede to the «pump lands,» where a new world was created by raising water from bayous. This district, as above said, is full of slightly raised ridges; the canals are run along these, not by digging, but by throwing up parallel dikes for a channel; as the water in all these regions lies below the land to be irrigated, it is raised by pumping plants at the heads of the canals, and distributed to the lands by gravity; sometimes two or more pump stations are needed on the same canal to lift the water high enough. This immense draft on the water supply has created alarm for the future; but the whole region is underlaid with exhaustless water-bearing gravel strata, and easily bored wells can irrigate 100 acres without diminishing the flow. In 1900 over 25,000 acres were thus irrigated. This prairie has the further advantage over the delta district, formerly the chief seat of the culture, that in the latter the heavy machinery needed for improved cultivation was apt to sink in the soil. The celebrated perique tobacco is grown in the Parish of Saint James. The product in 1902 was 33,375 pounds.

Stock Raising.— While this is small relatively to the other agricultural branches, it is of some importance; and in the line of dairy products is increasing. These were valued at over $4,000,000 in 1900, of which something over $1,000,000 was sold off the farm. Swine slightly increased, sheep slightly decreased; but as natural with increasing farm work of any kind, horses, mules and asses increased considerably more than half.

Fisheries.— Louisiana ranks next to Florida among the Gulf States in the value of its fish catch. As a whole, however, the industry seems not to be increasing largely; the last report in 1897 showed a total little larger than 1890, the figures being $713,587, the number of men employed 4,403, chiefly on the boat or inshore fisheries. The oyster fishery is second only to that of Chesapeake Bay, and was three fifths the entire value of the fisheries. The oyster reefs extend almost unbroken to the mouth of Atchafalaya Bayou to the State line. Large canneries have been established on the Gulf. The seine fishery is declining; but Louisiana is still the chief source of shrimps, as well as for catfish caught with the trot-line. The alligator catching industry is decreasing with the gradual exhaustion of the supply; at the same time the scarcity of hides constantly enhances the market value.

Manufactures.— These are chiefly concentrated in New Orleans, which produced in 1900 more than half the total for the State, which with 4,350 establishments, was valued at $21,181,683. In the eight chief industries of the State, making more than half the total, there was over a threefold increase from 1890 to 1900, and what is very unusual, there was almost exactly the same increase in the number of wage-earners who number 42,210; the industrial tendency is to increase product, but reduce human labor. The total bulk of manufacturing in the State is working up its raw materials of sugarcane, cotton, forest products, and rice. Foremost, and amounting to close upon two fifths of the State's entire manufactured products, is the refining of sugar. The sugar and molasses produced in the census year were valued at $47,891,091, and the business gave employment to 15.4 per cent of all the State's wage-earners. The greatest obstacle heretofore (aside from difficulties stated under *Agriculture*) has been the necessary idleness of the expensive plants during the greater part of the year; but an industry is now developing which serves a doubly profitable end,— the making of paper from the bagasse or cane refuse,— thus keeping the plants going, and utilizing a waste product heretofore used only for fuel. With a little jute or manila, this has been found to make one of the finest grades of heavy paper. Second in importance was the manufacture of lumber and timber products, aside from planing-mill products, sashes, doors, and blinds, etc., these were valued at $17,408,513, and had more than trebled in the decade. In 1890 the production was almost exclusively of yellow pine lumber, cypress shingles, and white oak staves; in 1900 there had been a great increase of the manufactures from cypress and hardwoods, cypress sawing alone employing many of the largest establishments in the State, and the stave manufacture having practically ceased. The lumber industry is just beginning to attract the attention of capitalists on a large scale,— this and rice being the business «booms» of the present. At no time in the State's history have there been so many large lumber plants under construction. The long-leaf pine manufacture has its centre at Lake Charles, in the southwest. The manufacture of cottonseed-oil and cake holds third place; in 1900 the products were valued at $7,026,452, while in 1890 they were somewhat over one fifth that amount. This is one of the industries fostered indirectly by the Mississippi jetties, which by increasing New Orleans' distribution facilities, have made it worth while to import cotton seed and develop a larger manufacture than the local supply would make possible. The refining of cottonseed-oil is a recent New Orleans industry. The cleaning and hulling of rice produced $5,736,451 of finished product. A great and rapidly developing industry is the manufacture of burlap bags for handling cotton seed, fertilizers, etc.; it grew from $669,945 in 1890, to $3,443,468 in 1900. The foundry and machine-shop products amounted to $2,672,761, their work largely in making and repairing sugar machinery. Planing-mill products and carshop work were considerable. There were in Louisiana in 1902-3 eight cotton mills with 101,752 spindles; the consumption was 18,003 bales of cotton. Many new mills are in construction.

Commerce and Transportation.— Louisiana is the richest State in the Union in total length of navigable streams, 3,771 miles. Its lower part is a vast web of paths to the ocean, aggregating 2,500 miles. The entire 600 miles of the Mississippi's length in the State is navigable and largely navigated, and the jetties have trebled its value, made New Orleans a far greater corn and cotton port than before, and will draw foreign commerce still farther. A canal from the river to Lake Borgne has greatly lessened the dis-

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STATE CAPITOL AT BATON ROUGE.

tance from the city to the Gulf and to the coal-fields of Alabama, hence reducing the cost of fuel for manufacturing purposes. The railroad facilities have not been very extensive till the last decade, when they increased from 1,739 to 2,801 miles, and are now 3,221. The growing importance of New Orleans has led a number of trunk lines to make a special effort for its business; owing to the nature of the Gulf coast, all turn away many miles from it. The chief lines are the Southern Pacific, the Texas Pacific, the Louisville & Nashville, the Queen & Crescent, and the Illinois Central. Many others are laying plans for entering the city. As with most Western and Southern States now, rates are fixed by railroad commission. New Orleans is the third port in the United States in amount of foreign commerce, next to New York and Boston. For the year ending 30 June 1902, its imports and exports (principally the latter) amounted to over $158,000,000. In 1902-3 it received 2,316,617 bales of cotton, and exported 2,112,281 bales. The vessels entering and clearing for the year were upward of 4,000, with a gross tonnage of nearly 5,000,000.

Banks.—The State has an excellent banking system, very conservative in its holdings of reserves; the New Orleans banks were notable for their exceptional solidity and punctuality in meeting northern obligations when the Civil War broke out. On 30 June 1902 there were 27 national banks in operation, with $4,182,580 capital, $2,667,364 in outstanding circulation, and $2,372,750 in United States bonds. There were also 66 state banks with $4,255,287 capital, and $631,295 surplus. In the year ending 30 Sept. 1902 the exchanges at the United States clearing house in New Orleans aggregated $663,918,045, an increase in two years of $163,000,000.

Government and Finance.—The Constitution of 1898 was devised to exclude the illiterate negro vote, except for owners of property to over $300 who are excepted from educational qualification. Otherwise than that, each voter must be able to fill out his application blank for registration, but this does not apply to anyone who was a voter on 1 Jan. 1867 (that is before the 14th or 15th Amendment was passed), or his son or grandson of mature age. Women taxpayers can vote on all questions of taxpaying in any subdivision of the State. State officers are elected for four years. The Governor has $5,000 salary, the pardoning power, and a veto by items, which may be overridden by a two thirds vote of the elected members of each house. The legislature holds biennial sessions limited to 60 days; both houses are elected for four years; the Senate may be from 36 to 41 in number, the House from 98 to 110, and as a fact the numbers are now 39 and 114; there must be one representative to each parish, and to each ward of New Orleans. The judiciary is headed by a supreme court, consisting of a chief justice and four associates appointed by the governor with the consent of the senate, for 12 years. There are judicial districts, to be not less than 20 nor more than 29; the judges are elected for nine years, as is the district attorney for each. From and after 1 July 1904 there is to be a court of appeals, composed of two district judges designated by the supreme court. There is a militia of 2,693. The State has a large Democratic majority. It sends two Senators and seven members to Congress. The assessed valuation of property in 1902 was $301,216,222; the State tax is limited to six mills on the dollar. The legislature cannot incur debts except to repel invasion or suppress insurrection. A poll tax on each adult male goes to the school fund (see *Education*). The bonded debt 31 Dec. 1902 was $11,108,300, with a floating debt of $1,157,002. The year's receipts from taxation were $2,747,262.

Education.—Louisiana, formerly near the foot of the ladder in the general education of its people, has made extraordinary efforts in the past two decades, and in some respects has surpassed all other Southern States; a fact more creditable from its large negro population. The average school term (120 days) was the longest of any Southern State, the terms of colored schools were as long as those of the white, and the amount expended is exceedingly creditable, being in 1901 $1,236,647, or nearly half as much as the current receipts of the State, and in 1902 nearly $1,500,000. The school revenues are made up of 1¼ mills from the State property tax of six mills on the dollar, a poll tax of $1 on all males over 21,—retained in the parish were levied, and other local taxes may be laid,—special corporation taxes, etc. By the law of 1902, the school administration is centralized in a State board of education consisting of the governor and seven appointees, the superintendent of education, and the attorney-general; this appoints a four-year board of education for each parish (county), who appoint parish superintendents. The enrolment in schools during 1901 was 63 per cent of the white children from 6 to 18, and 40 per cent of the colored; in both cases more than a three-fold increase in 20 years. Despite all efforts, however, the load of illiteracy is a heavy one to struggle against; 61 per cent of the negro and 17 per cent of the white population above 10 could neither read nor write. In 1901 there were 3,219 white teachers, nearly three fourths female; and 1,152 colored teachers, about evenly divided. Besides these there were many hundred private teachers. The pupils in the Catholic schools alone were stated at 23,398. Total pupils enrolled in common schools were 198,896. For higher education there were 22 public and 30 private high and secondary schools, two industrial colleges, the Industrial Institute at Ruston (north Louisiana) and the Southwestern Industrial Institute at Lafayette, two normal schools, the State at Natchitoches, and that of the city at New Orleans; the State University and Agricultural and Mechanical College at Baton Rouge, partly supported by the United States; Tulane University, with affiliated special colleges, one of the best reputed institutions in the South; and a number of Roman Catholic and sectarian colleges. For the colored people are four—Southern University, Leland University, New Orleans University, and Straight University. Total income for universities and colleges $284,623. Male students 1,518, female 563.

Charitable and Penal Institutions.—The State Board of Charities and Corrections can only inspect and report. The old system of leasing out convicts to private contractors was abolished by the constitution of 1898, and they are now only employed on public works or convict farms, or in manufactures owned and operated by the State; and parish jail inmates may be employed on public works within that parish. The State Insane Asylum is at Jackson, a Lepers' Home in Iberville Parish, institutions for the deaf and blind at Baton Rouge, and there are State hospitals at New Orleans and Shreveport. The health of New Orleans is regulated by the State Board of Health, composed of nine physicians, four appointed by the governor, and five by the New Orleans City Council.

Churches.— The strongest denominations in order of church societies, are the Baptists, Southern Methodists, the two forming the bulk of the Protestants, Roman Catholics, Presbyterians, Protestant Episcopalians, Lutherans, and Unitarians. The Roman Catholics are stronger here from the long Spanish and French domination than anywhere else in the South. In New Orleans are located a Roman Catholic archbishop and bishops of the Protestant and Methodist Episcopal churches. There is also a Roman Catholic bishop at Natchitoches.

History.—The earliest knowledge of Louisiana dates from the discovery of the mouth of the Mississippi in 1528 by Narvaez. De Soto, 13 years later, crossed the great river on rafts at some point about the Arkansas; of the importance of this discovery the Spaniards were wholly ignorant. The next Europeans to sail on the great river were the French. In 1673 Marquette and Joliet were sent by the governor of Canada to seek the river which might lead to the great western ocean. They descended as far as the mouth of the Arkansas. In 1682 they were followed by La Salle, who completed the work of discovery and took possession of the country, which he called Louisiana, in the name of Louis XIV. In 1684 he sailed from France with colonists to form a settlement. He missed the mouth of the river, landed at Matagorda Bay and was murdered in 1687. Brave men were not lacking to take up the enterprise, and in 1698 Iberville, with his brother, Bienville, sailed from Brest for the Mississippi. Finding the Spanish in possession of Pensacola, he stayed for a short time at Mobile, and then entered and explored the lower part of the rivers. His first settlement was at Biloxi, despite the protest of the Spanish governor of Pensacola. In 1702 the site of the colony was removed to Mobile. Antoine Crozat obtained the concession of Louisiana in 1712. It was handed over for 25 years to the Western or Mississippi Company, founded by John Law. Bienville was again made governor and was able to carry out his long-formed plan to create a city where is now New Orleans. Later, in 1722, he was able to make it the capital of the colony. The Western Company sent out large numbers of emigrants, and the colony increased in population, but not in prosperity; misgovernment and Indian wars prevented all progress. In January 1732 Louisiana was surrendered to the king. Iberville resigned in 1743 and was succeeded by Vaudreuil, under whom were isued levee ordinances and police regulations for New Orleans. In the following years there was no improvement in the condition of the colony, of which the annual expense was a drain on the exhausted resources of France. In 1762, by the treaty of Fontainebleau, Louisiana west of the Mississippi, together with the island of Orleans, was ceded to Spain, and in the next year Louisiana east of the Mississippi, together with Florida, was surrendered to Great Britain by the Treaty of Paris. The dissatisfaction of the Louisianans, and the long delay of Spain in taking possession of her new colony, gave rise to a serious revolt which was sternly suppressed by O'Reilly. He, however, provided for a form of government under which the colony made considerable progress. The great growth of the population on the upper Mississippi caused a demand for freedom from all restrictions of commerce on the river. This was obtained temporarily by concessions from the Spanish governors, but when the right of deposit was refused in 1803, there was grave danger of a descent on New Orleans. The desire of Napoleon to create a colonial empire in America led to the secret treaty of St. Ildefonse in 1800, by which France acquired that portion of Louisiana formerly ceded to Spain. In 1803 fear of English invasion induced Napoleon to sell Louisiana to the United States for $15,000,000. (See ANNEXATION; LOUISIANA PURCHASE, for statistics of size and location.) On 28 March 1804 the part south of lat. 33° N. was organized as Orleans Territory; the northern part being organized as Louisiana Territory, afterward changed to Missouri Territory. An enabling act was passed 20 Feb. 1811 to form Orleans into a State, and it was admitted 8 April 1812. The French element was so strong that the constitution allowed members of the legislature to debate either in French or in English, and the dividing line in politics was usually between the two, with temporary alliances of other elements. The organization of the Whig Party, one of whose cardinal tenets was protection, which helped sugar, turned Louisiana into one of the strongest Whig States in the South, she twice voting for Whig Presidents. The slavery issue, after 1860, made it more and more strongly Democratic, and in 1860 it was heavily for secession. New Orleans was captured by the Federal troops 25 April 1862, and the State government, whose seat had been Baton Rouge since 1852, was transferred to Opelousas. During the rest of the War the territory held by the Federals was recognized as the legitimate State government, though under a military governor, and sent members to Congress. On 30 July 1866 an attempt of the colored leaders to hold a constitutional convention at New Orleans and secure the admission of their race to the franchise, resulted in the massacre of many of the delegates by the whites; which had much to do with the excessive severity with which the subsequent Reconstruction government bore on the latter. (For the general history of the time, see RECONSTRUCTION. For the part borne by the State in the imbroglio of 1876, see ELECTORAL COMMISSION.) The most important item in the subsequent history was the passing of the Constitution of 1898, with the «Grandfather Clause,» to disfranchise the negroes, which has reduced the negro registration to about 7,000, as against over 120,000 whites. The State governors have been W. C. C. Claiborne 1812, Villere 1816, T. B. Robertson 1820, H. S. Thibodeaux 1824, H. Johnson 1824, P. Derbigny 1828, A. Beauvais 1829, J. Dupre 1830, A. B. Roman 1831, E. D. White 1835, A. B. Roman 1839, A. Mouton 1843, I. Johnson 1846, J. Walker 1850, P. O. Hebert 1853, R. C. Wickliffe 1856, T. O. Moore 1860, H. W. Allen 1864, M. Hahn

1864, J. M. Wells 1865, B. F. Flanders 1867, J. Barker 1868, H. C. Warmouth 1868, P. B. S. Pinchback 1872, W. P. Kellogg 1873, F. T. Nicholls 1877, L. A. Wiltz 1880, S. D. McEnery 1881, F. T. Nicholls 1888, M. J. Foster 1892, W. W. Heard 1900. The following are the names of the principal authors who have written on Louisiana: *History:* Le Page, DuPratz, Martin, Gayarre, Fortier. *Description:* Darby, Stoddard. *Botany:* Rafinesque, Chapman. *Orinthology:* Audubon. *Literature:* Fortier. *History and Development of New Orleans:* Cable, King, Castellanos.

Population.—The census figures from 1810, when it was first counted separately as the Territory of Orleans, are as follows: (1810) 76,556; (1829) 152,923; (1830) 215,739; (1840) 352,411; (1850) 517,762; (1860) 708,002; (1870) 726,915; (1880) 939,946; (1890) 1,118,587; (1900) 1,381,625. It was estimated in 1903 at about 1,470,000. The foreign born were 52,903, of whom 17,431, or about one third, were Italians, 12,604 Germans, 6,500 French, and 6,436 Irish. The colored population was 650,804, or nearly half, a relative decrease since 1890 of over 12 per cent., due to the higher death rate among the negroes. Louisiana was sixth in absolute number of colored inhabitants, and third in relative number, next below Mississippi and South Carolina. There are 59 parishes or counties in the State. The legislature is forbidden to create new ones with less than 625 square miles and 7,000 inhabitants, or divide an old one so as to leave either portion less than these magnitudes. There are no large cities, except New Orleans with 287,104 people, in 1900, and in 1904 over 300,000; the great Mississippi port, and destined to a much larger growth. Shreveport, the next, on the upper Red River, had 16,013; Baton Rouge, the capital, on the Mississippi, 11,269. The only others above 5,000 are New Iberia in the south and Lake Charles in the southwest (the latter the head of the long-leaf pine manufacture), Alexandria on the lower Red River, and Minden east of Shreveport.

Sociology.— Owing to the preponderance of the population and the general importance of New Orleans it has been found useful to locate there institutions usually found at the State capitol. The Supreme Court sits in the Cabildo on Jackson Square, and the State Library is also in the city. The two most important libraries in the State are the Howard Memorial Library for reference, and the New Orleans Public Library for circulation established, which provide for the public of New Orleans the use of nearly 100,000 books. There are published in the State 188 newspapers, of which two, the New Orleans *Picayune* and the New Orleans *Times-Democrat,* are important dailies. The literature of the State consists of two groups of writings: the one in French covering the period between 1835 and 1855, including those of Gayarre and Rouquette, and a brilliant series of works in English prose and poetry by Townsend, King, Davis, Fortier, Ficklen, etc., which have been produced in the last 30 years of the 19th century.

William Beer,
Librarian Howard Memorial Library,
New Orleans.

Louisiana, Mo., city, in Pike County, on the Mississippi River; and on the Chicago & A., and the Chicago, B. & Q. R.R.'s; about 85 miles northwest of St. Louis. It is situated in an agricultural region, and is the trade centre for a large extent of country in both Missouri and Illinois. Its chief industrial plants are flour and lumber mills, button factories, brick yards, lime works, tobacco factories, wagon and carriage factories. Nearby are large quarries and extensive nurseries. The trade is chiefly in its manufactured articles, dairy and nursery products, grain, fruit, and live stock. There is a good public library. Pop. (1900) 5,131.

Louisiana, Code of. In the history of law in the United States the first important experiment with a code in the United States was made in Louisiana, which State, originally a French colony, afterward ceded to Spain, again returned to France, and subsequently acquired by the United States from France, has had many changes of law. After the United States acquired Louisiana there arose a strong demand for a code, owing to the great confusion of laws. In 1806–8 a code was adopted, but only to supersede the ancient laws when they conflicted with it. A complete civil code was adopted for the State in 1824, which had for its basis the *Code Napoléon,* although some provisions of the common law were injected into it. The Louisiana code was the foundation for a later code prepared for the State of New York under the guidance and supervision of David Dudley Field. This code, although published, and having formed the foundation for many of the codes adopted by the various States, was never accepted by the legislature of New York. See Code.

Louisiana Creoles. This appellation belongs exclusively to persons of French and Spanish descent born in Louisiana: notwithstanding the prevalent error to the contrary according it to Louisiana-born children of any European blood. Though often misrepresented, the creoles of Louisiana, as a matter of fact, are intelligent, brave and generous, and are, by no means, inferior in the matter of education; they are also in the enjoyment of the highest social privileges. The women of true creole lineage are world-famed for grace and beauty. The creoles have furnished Louisiana some of its ablest governors, its most distinguished military men, its eminent writers, its leading professional men, financiers and merchants. In 1904 they held a number of the most exalted offices in the State, and were likewise fully represented in all branches of high and meritorious effort. Very many of the creoles now in Louisiana are descended from high and noble families in France and Spain, and they treasure the lofty traditions of their ancestry. The expression «creole negro» is often used, and its employment has perhaps contributed to the false impression which some entertained that the Louisiana creole, truly such, must be, or is, of negro blood. The term under immediate consideration simply means that the negro to whom it is applied, or his progenitors, has been reared under a creole master. So far as the true creole families are concerned, they have been jealous of their Caucasian lineage and careful to maintain the purity of their blood. The word «creole» is often used to designate the origin of certain products of the field and farm, such as creole chickens, eggs, butter, etc. The meaning of this is that the products thus named are strictly from creole portions of the State of Louisiana. A certain debased idiom of the French employed among negroes, and, to some extent, among creole children and lower whites, is popularly called «creole.» It has figured in literature in the shape of short stories, proverbs, etc. The better element of creole adults speak and write the French language in its purity. The majority likewise, have a correct and fluent use of the English language. An effective answer to the aspersions, by some sought to be cast upon the character of the olden creoles, is the following citation from the Chevalier Guy Soniat du Fossat, a distinguished officer of the French army who was in New Orleans in 1751. In his ‹Synopsis of the History of Louisiana, etc.,› he gives the following:

«Creoles are defined to be ‹the children of Europeans born in the colony.› They, in general, measure about 5 feet 6 inches in height; they are all well shaped, and of agreeable figure; they are lively, alert, and agile, and, notwithstanding the great heat of this climate, are laborious. They are born with ambition, and an honest self-esteem. They are endowed with a natural disposition for all sciences, arts, and exercises that amuse society. They excel in dancing, fencing, hunting, and in horsemanship. Nature has favored them with a penetrating and active mind, and they are capable of being easily instructed. The lack of teachers renders their education somewhat incomplete, and it must be said, in all justice, that among the many qualities which they possess are politeness, bravery, and benevolence. They are good fathers, good friends, and good kinsmen.

«The women, besides having the qualities above enumerated, are agreeable in figure and seldom deformed. They make good mothers, and are devoted to their husbands and their children, and in their marital relations seldom are they unfaithful. I must also add that the stranger arriving in this wild and savage country will be surprised to see in this capital, as exists in all countries of Europe, brilliant assemblies where politeness, amiability and gayety reign supreme.»

Bussière Rouen,
Officier d'Académie,
Secrétaire perpetual de l'Athénée Louisianais.

Louisiana, District of. See Orleans, Territory of.

Louisiana Purchase, The, was the purchase by the United States from France of the Province of Louisiana, the treaty of sale being dated 30 April 1803. The price paid for the province was $15,000,000. Its area was 875,000 square miles (almost as great as that of England, Ireland, Scotland, Wales, France, Germany, Spain, the Netherlands, Italy and Switzerland), as compared with 820,944 square miles in the original 13 States. Its limits extend from the Mississippi River on the east (including the New Orleans district east of the Mississippi) to the main divide of the Rocky Mountains and to the Arkansas, the Red and the Sabine rivers on the west; and from the Gulf of Mexico to the Canadian line.

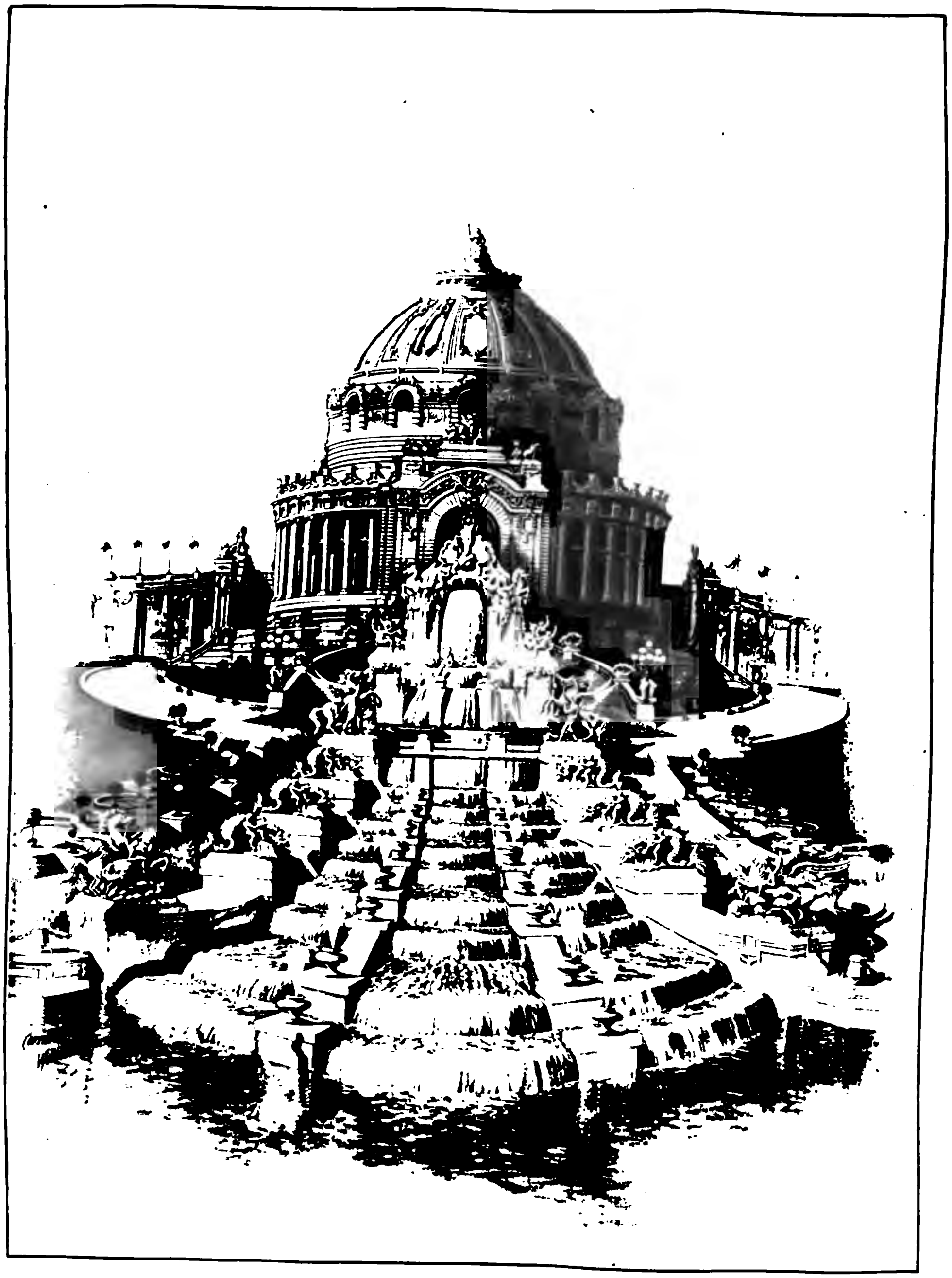
The results of this transaction were to prevent forever the erection of a hostile power on the west bank of the Mississippi and to make inevitable the ultimate annexation of Texas, Oregon, New Mexico, and California, and the expansion of the United States into a nation of continental proportions and of world influence. It was perhaps the most important sale of territory ever made. President Jefferson wanted New Orleans in order to control the mouth of the Mississippi on the east side, and offered to guarantee to Napoleon all the territory west of the Mississippi if this inducement became necessary in order to get that town. Looking for a city, he had an empire thrust upon him. Napoleon's necessities — his war with England, his desire for money to aid in prosecuting the war, his determination that England should not gain the territory, and his wish to raise up a rival to England on sea and land — worked to the eternal advancement of the United States, of representative institutions, and of the world's progress.

The wilderness which Jefferson's enemies ridiculed him for buying comprises to-day, in whole or part, chiefly in whole, 12 States — Louisiana, Arkansas, Missouri, Iowa, Minnesota, North Dakota, South Dakota, Nebraska, Kansas, Colorado, Wyoming and Montana — and Oklahoma and the Indian Territory. This region is nearly a third of the area of the present United States, and it gives homes to almost a fifth of its inhabitants. Its population of 50,000 in 1803 had expanded to 14,708,616 in 1900, or nearly three times the population of the entire United States in 1800, and in 1904 amounted to nearly four times the whole country's population at the time Washington was first inaugurated as President.

The States and Territories of the Purchase produced 264,000,000 bushels of wheat in 1900, valued at $152,000,000 — more than half of the wheat crop of the whole United States; 1,013,000,000 bushels of corn, or 48 per cent of the country's product; 38 per cent of the country's oats. The wheat, corn, oats, rye, barley, cotton, hay and potatoes produced in this region in 1900 brought $755,000,000, and its farm animals were valued at $825,000,000, 38 per cent of those of the whole country.

Besides transferring the United States' boundaries from the Mississippi ultimately to the Pacific, the Louisiana annexation and its direct results, the acquisition of Texas, of New Mexico, of California and of Oregon, swung the seat of the country's activities across the Alleghanies into the great valley. The geographical centre of the contiguous parts of the United States is in northern Kansas, in the heart of the Louisiana Purchase, and the other pivotal points are traveling rapidly in the same direction. The centre of population, which was a few miles west of Baltimore in 1801, when Jefferson was first inaugurated, was near Columbus, Ind., in 1900; and the centre of manufactures, which was hurrying after it, was close to Mansfield, Ohio, in the same year. At the same time the centre of the corn production was 54 miles southwest of Springfield, Ill., and the centre of the number of farms was 110 miles east by south from St. Louis, in Wayne County, Ill., not far from the Louisiana Purchase border.

Louisiana Purchase Exposition, The, or **Universal Exposition,** held at Saint Louis,



THE HALL OF FESTIVALS.

THE ARTISTIC CENTRE OF THE EXPOSITION.

Mo., in 1904, opening 30 April; one of the greatest exhibitions the world has ever known; 42 States and 53 foreign governments having exhibits. The various States appropriated $3,000,000 more for this exposition than for the Chicago World's Fair, and the vast exhibit covers more ground than the Chicago, Paris and Buffalo expositions combined. The Government Building is one mile from the Grand Trianon of France, along a stately boulevard, between eight of the finest exhibit palaces ever built. The boulevard is crossed by three courts; the central court is 2,500 feet long and 600 wide. Between the palaces is a mile of lagoons and canals. The amusement street is a mile long. The Philippines cover 40 acres. The Agricultural Palace is 1,600 feet long and covers 20 acres. The dome of the Hall of Festivals is 200 feet high. In it is the largest organ in the world, 62 feet wide, 40 feet high, with 10,000 pipes. The intramural railroad is nine miles long and touches every point of interest in a site two miles long and one mile wide. In fact, the attractions at this exposition are so many and varied and the undertaking so enormous that no detailed description can be given. A volume of over 200 pages is required for the prize lists and regulations of the Live Stock Department alone. This department includes eight groups, and there are 15 of these great Exhibit Departments, including 141 groups and 801 classes. Large bodies of State commissioners in all the States, assisted by local committees in counties were engaged for over a year past in collecting the best specimens that liberal prizes could call forth. All known governments co-operated in this work, each intent upon making the best possible exhibit. The Exposition shows all the products, processes, inventions, discoveries and triumphs of art and industrial skill, and is a vast museum of human progress, human efforts, hopes and aspirations. Besides broadening the scope of each department so as to include a greater number of related groups and classes, this Exposition was the first to organize a distinct Educational Department and rank it in the post of honor at the head of the list. Here, for the first time, the educator is given opportunity to compare intelligently the educational systems, institutions, methods and work of the various European nations with those of the United States, which include the competitive exhibits of the public schools of all the States and cities. In the Social Economy Department is exhibited the most complete and thorough illustration of the new Science of Humanity yet attempted, embracing all the enormous advances in the past ten years along this line by every government and city of Europe and America; showing state regulations of industry and labor, industrial organization of workers, methods of industrial remuneration, co-operative institutions, the housing of the working classes, liquor regulations and general betterment movements. Independent of this department, but related to it as an «outside exhibit» there is a great «Model City» in which the leading cities of Europe and America have displays illustrating their municipal utilities, economies and betterments — displays full of interest and edification for the urban taxpayers and home owners of America. The Physical Culture Department, equipped with a gymnasium and athletic field, race track and an immense amphitheatre, and aided by the counsels and active co-operation of the leading athletic associations of the world, conduct a protracted series of athletic events lasting from 14 May to 24 November, at which a long list of splendid prizes and championships will be competed for in intercollegiate, interscholastic and international contests, embracing all sorts of games, feats and sports. Among these will be the great Olympic games under the direction of the International Olympic Committee; contests of historic and worldwide interest, enlisting the world's most famous athletes and champions. The still exhibits of this department will include everything illustrative of physical culture and its methods; gymnastic trophies and gymnastic equipments for schools and associations. Among other features are the International Press Parliament, the International Congress of Jurists and the World Congress of Arts and Sciences, in the discussions of which the most distinguished professors, publicists and teachers of the world were invited. The deliberations illuminate every branch of art, science, and education, economics, politics, philosophy, technology, sociology, etc., involved in the comprehensive scope of the exhibits. Here will also be assembled the world's first fleet of air-ships and flying machines, in competition for a prize of $100,000.

Each of the 15 departments in the great exhibition outgrew all plans and anticipation; and the result is a much vaster display than was thought possible even in this advanced age. Additional areas were necessarily allotted to the great palaces of Art, of Liberal Arts, of Manufactures, of Varied Industries, of Machinery, of Electricity, of Transportation, of Agriculture, of Horticulture, of Fish, Game and Forestry, and of Mines and Metallurgy. Besides the Exposition Company's cash fund of $15,000,000, there has been spent $1,650,000 by the United States Government on its own separate exhibits; over $6,000,000 by foreign governments; $6,500,000 by the several States on their exhibits, and immense sums by cities, associations, fraternities, corporations and individual exhibitors.

During the last 50 years each of the recognized Universal Expositions has surpassed its immediate predecessor. Each was an epitome of the new ideas, new discoveries, new achievements of a new period in the world's progress, and as the art of organizing and equipping Expositions progressed, and the world's appreciation of their value increased, larger endowments were obtained for them, and choicer and more comprehensive exhibits became available from all parts of the world. Governments, scientific societies and art organizations were everywhere accumulating finer specimens in their museums, and becoming prepared to make better and better contributions to the treasures of a World's Fair exhibit, thus greatly widening the Exposition's choice of articles. By this natural process the Louisiana Purchase Exposition came into possession of better opportunities and advantages, and far ampler resources than any of its predecessors. In every field of improvement, social, industrial, or intellectual, it gathered the priceless products of the prolific seeds its predecessors planted. For the first time in the history of expositions, foreign governments actively helped to collect for the exhibition the finest productions of every clime, and the most excellent achievements of mankind, in arts and crafts and in all lines of social improvement. The arrangement of exhibit plans and the preparations were under the direction of first honor graduates in Exposition science — men identified with Exposition work at home and abroad for the last 30 years. The knowledge and inspiration diffused abroad from every great exposition have stimulated and guided men to so many new discoveries and the invention of so many new industrial utilities, to say nothing of what has been done for the elevation of public ideals in morals and matters of taste, that the world is now, more than ever before, sensible of its indebtedness to their unique educative influence. Instead of being the last, the Exposition of Saint Louis will merely fix the higher standard and afford the better model for other Universal Expositions that will follow in succeeding decades, so long as the Promethean spirit impels men to emulate the gods as benefactors of mankind. The periodic market «fairs» of earlier centuries were the natural outgrowth of economic conditions under a ruder civilization and a cruder industrial development. Such «fairs» still survive under similar conditions in several countries and some have risen to great importance as promoters of trade. As advancing civilization with its modern appliances and modern industrial organization has superseded the market fair with better traffic facilities, their other social utilities have been preserved in competitive exhibitions, offering prizes for the best productions. The noted effect of these local competitive exhibitions in arousing emulation and directing attention to better models and higher standards of industrial effort led to the National Expositions which the great Napoleon inaugurated in France more than 100 years ago, the evolution of which has given us the constantly progressing series of World's Fairs that have stimulated and guided the geniuses of all nations through the last five decades of the 19th century.

David R. Francis,
Pres. of the Louisiana Purchase Exposition.

Louisiana State University and Agricultural and Mechanical College, a State educational institution at Baton Rouge, La. In 1855 a State school was founded under the name of the State Seminary of Learning, and was opened in 1860 with W. T. Sherman (later General Sherman) as superintendent. In 1861–5 the school was suspended on account of the war. In 1874 an agricultural college was established and temporarily located at New Orleans; in 1877 it was merged with the college at Baton Rouge and the university chartered under its present name. The courses offered are the Latin-scientific, literary, general science, mechanical and civil engineering, agriculture, and commerce; in the agricultural department a special course of 5 years is given on the cultivation and manufacture of sugar. There are three experiment stations connected with the University, one at New Orleans, one at Baton Rouge, and the third at Calhoun. Military drill is also a part of the curriculum. In 1903, the total income, including State and Federal appropriations, amounted to $55,500; the number of students was 400, of professors and instructors, 27; and the library numbered 23,000 volumes.

Louisville, loo'ĭs vil or loo-ĭ-vĭl, Ky., the capital of the County of Jefferson, and the principal city of the State of Kentucky, is situated opposite to the falls of the Ohio River, on the Southern shore of the river, on the Louisville & Nashville, the Southern, the Chesapeake & Ohio, the Baltimore & Ohio Southwestern, the Pennsylvania, and other railroads.

Falls of the Ohio.— The falls of the Ohio River are caused by a ledge of Devonian rocks, rich in corals and other fossils, which were lifted from the bottom of the Silurian Sea, in which they were formed, and left here thousands of feet above their place of formation. In ancient geological times this wall of rock, in the form of an anticlinal axis, dammed up the water 25 feet and formed a lake a mile wide and several miles in length, above the dam, while the water below rushed down the other side of the axis, at the rate of a dozen miles an hour, until it was lost in a seething whirlpool below. When the river was low, it was dangerous to attempt to conduct a boat over these falls but when it was high, on account of the narrowness of the stream below and its width in the lake above, the excess of water filled the narrower stream below to a level with the wider one above and vessels passed over the falls as if they had not been there. In 1830 a canal two miles long was finished around the falls, on the Kentucky side, and on the 5th day of December the steamboat Uncas passed through it. The canal has since been enlarged and improved so as to meet the wants of the largest boats and is always used in going over the falls in low water. When the river is high, boats go over the falls and do not have to use the canal.

Site of Louisville.— The natural beauty of the falls of the Ohio was such that they could hardly fail to attract the attention of the intelligent eye which looked upon them. A dense forest with a very great variety of growth covered the country for miles around and the huge sycamores and cottonwoods, growing down to the water's edge, cast their shadows into the stream, not yet polluted by the waste of cultivated lands, and imaged another forest there. Crystal ponds scattered through the forest and verdant islands in the river added beauty and variety to the landscape. When Capt. Thomas Hutchins, of the British Engineers, saw the falls in 1766 he was so delighted with their natural beauty that he drew a picture of them which appeared in his 'Topographical Description of Virginia,' published at London in 1778. It was a very pretty picture then, is now, and always will be.

Plan of Louisville.— The plan of Louisville as originally laid out by John Corbly, in the spring of 1779, consisted of one range of streets parallel with the river and another range cutting them at right angles. The streets parallel with the river and running east and west bore names such as Water, Main, Market, and Jefferson, while the cross streets were known by numbers, such as One, Two, Three, etc. This plan was adhered to until additions to the original boundary made it necessary or gave an excuse for laying out new streets differently. In some of the additions the streets now run in all directions. Broadway as originally laid out, is 120 feet wide; Main, Market, and Jefferson, each 90 feet, and the other streets with a few unimportant exceptions 60 feet in width. In 1813 the paving of streets began. Previous to this time they were mud holes in winter and dirt-piles in summer. That part of Main Street ments; the 9 medical colleges, the 2 theological seminaries, the 10 musical societies, the 25 Catholic institutions and the 9 educational associations in some of which the sciences are taught, all together offer advantages to students in almost every branch of knowledge. The Male High School, the Female High School, the Normal School and the Manual Training School, like the ward schools, are free institutions entirely supported by the city.

Charitable Institutions.— Hospitals, asylums and homes are almost as numerous in Louisville as schools. The Children's Free Hospital, where afflicted little ones are cared for, the Kentucky Institute for the Blind, where the sightless are taught to read and write, and 51 other institutions maintained for different purposes are prepared to meet almost every form of infirmity.

Churches.— There are 240 churches in Louisville, in which quite a variety of religions are cherished. The principal denominations are the Baptists, the Methodists, the Presbyterians, the Christians, the Episcopalians, the Catholics, and the Lutherans, but there are also Unitarians, Evangelists, Jews, and those who call themselves Non-Sectarians, Scientists, Seventh Day Adventists, Social Settlements, Spiritualists, Swedenborgians, United Brethren, and Theosophists. Some of the houses of worship like the Cathedral of the Assumption, the Warren Memorial, the Third Avenue Baptist and the Fourth Street Christian, are fine specimens of ecclesiastical architecture and capable of seating large congregations.

Banks.— There are 14 banks and banking institutions in Louisville with a combined capital of more than $7,000,000 and a surplus of half as much more. If the four trust companies and the two title companies which necessarily do a good deal of banking business are added to the banks the capital and surplus of all combined will exceed $12,000,000. The clearing of the banks for the year 1903 were $529,241,195. The largest day's clearing amounted to $2,867,000 on the 2d of January and the whole month of January showed the sum of $50,706,431. Although the banking capital of the city cannot be said to be large the manner in which it is managed makes money almost always abundant. It is seldom that there is a stringency in the money market here which continues long or really amounts to inconvenience.

Finances.— The finances of Louisville will compare favorably with those of any other municipality in our country. According to the last published report of the assessor the assets of the city amounted to $17,442,552 and the liabilities to $8,836,129. If the liabilities therefore are deducted from the assets, a balance of $8,616,422 will remain in favor of the city. Any bonds issued by the city are therefore what is known as gilt-edge, for if the city should fail to pay the interest or the principal its property can be sold for the payment. The city, moreover, besides owning this large amount of property in its own name has an income from taxes sufficient to meet all of its fixed liabilities and current obligations. The property within the city limits owned by individuals was assessed last year at $132,000,000. The charter only allows 95 per cent of this amount to be considered in providing for current expenditures so that $6,600,000 must be deducted from this amount. We must also deduct 2¼ per cent allowed for prompt payment of taxes. At the rate of $1.86 tax, the sum of $2,279,960 is raised from the balance, to be expended by the city during the year. This amount is distributed through the different departments of the city so as to provide for every liability and at the end of the year balances are generally left in different departments which are again distributed.

Largest Industries.— Six of the largest industries are whiskey, tobacco, cement, wagons, plows, and leather. More Bourbon whiskey is made in the Fifth District of Kentucky and handled in Louisville than in any other locality. The same may be said of leaf tobacco, and especially Burley leaf. Louisville is the largest market in the world for both of them. The quantity of hydraulic cement, and plows and wagons and leather made here is also enormous. The Board of Trade gives the following figures for 15 leading articles:

Agricultural Implements — pounds	40,000,000
Boots and shoes — cases	114,000
Dry Goods and Notions — cases	678,000
Flour — barrels	710,000
Furniture — pounds	30,000,000
Hardware — cases	985,000
Fine Leather — pounds	11,500,000
Saddlery — packages	255,000
Stoves and Stove castings — pounds	29,500,000
Soap — pounds	27,000,000
Manufactured Tobacco — pounds	52,000,000
White Lead and Paints — pounds	17,500,000
Wagons — pounds	35,900,000
Whiskey — barrels	365,000
Woolen Goods — pounds	15,000,000

Water.— The city owns the works which supply the citizens with water. They are valued at $7,000,000, and a filter is now being added to the plant which, if successful in separating the mud and slime from the water, will make the works cost much more and be proportionately more valuable. The water is sold to citizens at a price much lower than they could obtain it in any other way.

Light.— The citizens have choice of three kinds of light furnished by different companies: these are electricity, artificial and natural gas. If they don't like either of them they can go back to the candles and lamps of their ancestors and do as they did before gas or electric light was invented. Natural gas is also much used for heat on account of its cleanliness and convenience.

Street Railways.— Street railways on which cars run by electricity ramify every part of the city and extend into the suburbs and to distant neighboring towns. No one need walk more than a square in any important part of the city unless he or she prefers to do so. The fare is only 5 cents for the longest distance in the city.

Steamboats.— Steamboats with headquarters at Louisville, in spite of the interference of railroads, are yet seen upon the Ohio and other Western waters, and afford the cheapest rates of freight. There are not, however, so many floating palaces upon the Western rivers as there were before railroads came into use, but there are yet a few which prevent the Ohio and its glories of old from being forgotten.

Board of Trade and Commercial Club.— There is a Board of Trade which keeps an eye on the interests of Louisville, and a Commercial Club which helps in the work. Any enterprise which looks to the interests of the city can be

his raw recruits. When he reached an island in the midst of the Falls, afterward known as Corn Island, and saw the rapid waters dashing around it, he concluded that was the place he wanted, and that no deserter could make his escape from this island. Hence he landed on this island, on 27 May 1778, and immediately went to work to erect cabins for some 20 families of emigrants who came on his boats, and a block-house for his soldiers and supplies. He was opposed to these families coming on his boats, but was glad they had come, as he could leave the supplies he could not take with him in their care on the island and thus take with him every soldier. At the end of a month he thought his raw troops had been disciplined enough to make them reliable soldiers, and moved off with them down the river to Fort Massac, leaving the emigrants on the island, while the sun was in a full eclipse. The families thus left on the island became the founders of Louisville. So far as has been ascertained, they were about 50 in number, consisting of men, women, and children, and one negro. They remained on the island until the news came that Gen. Clark had conquered Kaskaskia, Vincennes, etc., and put an end to the Indian raids, that came from the British posts there to prey upon the helpless families of the Virginia border. Then, by order of Gen. Clark, they built a fort on the main shore and moved into it in time to celebrate their first Christmas in the wilderness with a dinner and a dance.

The interest attached to the subject among the descendants of these founders of Louisville, who are numerous, will justify the record of their names here for the preservation of their memories. So far as has been ascertained they were the following:

James Patton, his wife Mary, and their three daughters, Martha, Peggy and Mary.

Richard Chenowith, his wife Margaret, and their four children, Mildred, James, Jane and Thomas.

John McManess, his wife Mary, and their three children, John, George, and James.

John Tewell, his wife Mary, and their three children, Ann, Minnie, and Jessie.

William Faith, his wife Elizabeth, and their son John.

Jacob Reager, his wife Elizabeth, and their three children, Sarah, Mariah and Henry.

Edward Worthington, his wife Mary, his son Charles, and his two sisters, Mary (Mrs. James Graham) and Elizabeth (Mrs. Jacob Reager).

James Graham, his wife Mary.

John Doune, his wife Martha, their son John, and their colored man, Cato Watts.

Isaac Kimbley, and his wife Mary.

Joseph Hunter and his children Joseph, David, James, Martha (Mrs. John Doune) and Ann.

Neal Dougherty, Samuel Perkins, John Sinclair, and Robert Tevis.

There may have been others whose names have not been preserved, and some of those named may not have been among the number. The list, however, is probably the best that can be made at this late day.

The above named persons who came to the Falls with Gen. Clark, and those who joined them as immigrants in the following spring, held a public meeting 10 April 1779, and appointed William Harrod, Richard Chenowith, Edward Bulger, James Patton, Henry French, Marsham Brashears, and Samuel Moore trustees to lay out a town. These trustees met on the 17th of April 1779, and, having agreed upon a plan of the town, named it Louisville and employed John Corbly, a surveyor, to lay it out and make a map of it. The plan of the town, as mapped out by Corbly, consisted of nothing but one street running along the bank of the river and 12 cross-streets cutting it at right angles. The numbering of the lots on Corbly's map can be likened to nothing but a puzzle of the most exasperating and unsolvable kind. The numbering is not consecutive and could not have been a reliable guide to the owners or anyone else.

On the first day of May, 1870, the legislature of Virginia, in response to a petition of those who had laid out the town, confirmed their act and appropriated 1,000 acres of the land which had been forfeited from Connolly, for the benefit of the town. The same act of the legislature appointed nine trustees to manage the affairs of the town. These trustees were John Todd, Stephen Trigg, George Slaughter, John Floyd, William Pope, George Merriwether, Andrew Hines, James Sullivan, and Marsham Brashears.

The city continued under the government of trustees, either appointed by the legislature of Virginia or Kentucky or elected by the people, from 1780 to 1828. It might be interesting to point out the acts of the trustees as city-builders during the period of 48 years, but space is not permitted here for such details. Room can only be allowed to sum up in a few words the result of their many acts.

Under their administration the city grew from a few log cabins, straggling along Main Street, which was nothing but a blazed dirt road through the forest, to comfortable and tasteful houses of brick and stone along paved streets. They hewed down the dense forests where the wild animal and the wilder savage dwelt, and drained the ponds which bred disease and death. They increased the population from only about 100 to 10,000, and the value of property in the city from nothing, to which they were reduced by their contest with Col. Campbell, to $2,500,000. They were an easy-going board of old Virginians, who liked things to go well of their own will, but avoided no labor or danger when their duty required them to act. They had some queer rules for the government of their meetings, such as confiscating to their own use any liquor that a member might presume to bring a second time to a meeting, and passed some funny resolutions, such as the one which offered a premium for the scalps of rats; but no breath of scandal was ever whispered against them or their acts. They generally come into office poor and went out poorer. They held office at too early a day to make money out of it as modern officials do. They passed but few, if any, resolutions which yet stand for law, and left no public buildings that are yet among us to call them back to memory. They did one good thing, in laying off Main and Market and Jefferson streets 90 feet wide, but they did another which over-balanced this good act when they abandoned the public grounds Gen. Clark had mapped out and prevented the city from having parks at the beginning of its career.

By the charter of 1828 Louisville passed from the government of trustees to that of a mayor and 10 councilmen. The first election under the charter occurred 4 May 1828, when John C. Bucklin was elected mayor. At the at the grotto, the flags of all nations show that pilgrims from the countries of the whole world have visited the place. Again and again have scientists investigated and reported for and against the miraculous appearance of the spring and its efficacy as a cure for diseases. There has never been imputed any wrong motive to “Bernadette” or her parents. Pop. (1901) 8,708.

Consult: Lassere, ‘History of Lourdes’; Boissaire, ‘Lourdes, Histoire medicale’ (1891); ‘Les Annales de Notre Dame de Lourdes’; Saint John, ‘The Blessed Virgin in the 19th Century’ (1902).

Louse, the name of small parasitic insects of a family (*Pediculidæ*) of doubtful affinities, but usually considered to be *Hemiptera*, much degraded through long-continued parasitism. The lice are all of small size, have soft, much flattened bodies with thin integument, the abdomen enlarged, the thorax indistinctly segmented, and without the slightest trace of wings, and the short legs terminated with strongly hooked, stout claws. The mouth-parts are adapted for sucking, but the homology of the several organs with those of the *Hemiptera* is still doubtful. There is a short proboscis provided with hooks, from the centre of which, when fixed in the skin of the host, there protrudes an extremely delicate tube. The head is also provided with a pair of short, three or five-jointed antennæ and small simple eyes. Probably on account of their disgusting habits the lice have been but little studied, and beyond the fact of their parasitism very little is known of their habits. They feed exclusively upon blood, which is secured by wounding the host's skin, fixing the proboscis by means of its hooks, and inserting the delicate tube above mentioned in the wound. A suction-bulb in the head propels the blood through the long writhing œsophagus into the bilobed stomach. Lice never leave their host except to pass to another, and the eggs, as well as all stages of the young, are found with the adult. Only six genera and less than fifty species have been described, but it is probable that a very great many others remain undiscovered. They are found on mammals exclusively, each species of mammal commonly harboring a peculiar species of louse. Man is more richly endowed, having three species: the head-louse (*Pediculus capitis*), the body-louse (*P. corporis*), and the crab-louse (q.v.). The two first mentioned are very closely alike and are said to vary according to the different races of men which they infest. Human lice are of course associated with filth, and are found only upon neglected children and persons of uncleanly habits. A very remarkable louse is found on the seal, and is consequently aquatic. The bird-lice (q.v.) or *Mallophaga* are entirely distinct from the true lice.

Consult: Schiödte, Annals Nat. Hist., 1866; Piaget, ‘Les Pediculines’; Giebel and Nitzsch, ‘Insecta Epizoica’; and various recent papers on Mallophaga by Kellogg in the ‘Proceedings U. S. National Museum.’

Louse'wort, any of various weeds of the genus *Pedicularis*, of the broom-rape (q.v.) family, which contains low, usually pubescent, perennial herbs, with chiefly pinnatifid leaves, and a spike of purplish, two-lipped flowers. The species are few, and the most common is *P. canadensis*, sometimes called wood-betony.

Louvain, loo-văṅ (Flemish, *Leuven;* German, *Löwen*), Belgium, city in the province of Brabant; on the Dyle, 15 miles east by north of Brussels. It was surrounded by earthen ramparts, which have been converted into pleasant promenades, which form almost a perfect circle, diameter nearly two miles. There are many buildings of historical interest, among which are the Hôtel de Ville, one of the richest and most beautiful Gothic buildings in the world, elaborately and exquisitely decorated in every part of its exterior by sculptures of subjects taken, for the most part, from the Old Testament (restored 1842, injured by lightning 1890); the collegiate church of St. Peter, almost opposite the Hôtel de Ville, built at the end of the 14th century, an edifice of vast extent, and rich in works of art, particularly a fine ‘Holy Family’ by Matsys. The educational institutions are numerous, among them are the university, which has a number of American students who are studying for the priesthood, a college, an academy of fine arts, two normal schools for the training of teachers, several secondary and elementary schools. There are hospitals, homes for orphans, and other charitable institutions. It has a number of manufactories, the most important of which are the tanneries. For a general trade the town is well situated, having ample communication both by railroad and the Louvain canal. The name of Louvain first appears in history about the end of the 9th century. It was surrounded with walls in 1115, but was afterward much enlarged. The dukes of Brabant inhabited the castle till the 13th century. At the beginning of the 14th century Louvain was the capital of Brabant, contained 200,000 inhabitants, and had an extensive and flourishing trade in the manufacture of broadcloth and all kinds of woolens. The populace, jealous of the privileges of the nobles, revolted in 1382, and being overcome by Duke Wenceslaus and subjected to severe oppression, emigrated in great numbers to England, and thus caused the decay of the town. Pop. (1901) 43,308.

L'Ouverture, Toussaint. See Toussaint L'Ouverture.

Louvois, François Michel Le Tellier, frăṅ-swä mē-shĕl lė tĕl-ē-ā loo-vwā, Marquis of, minister of war to Louis XIV.: b. Paris January 1639; d. 16 July 1691. He was early made a royal councillor through the influence of his father. After 1666 he had the whole management of the ministry of war, and soon exercised a despotic control over his master the king, and over the army. His extensive knowledge, his decision, activity, industry, and talents, rendered him an able minister; but he was too lavish of the blood and treasure of France. Justly appreciated, Louvois must be considered as the evil genius of the showy but disastrous reign of Louis XIV. The war of 1672 against Holland was begun at his instigation. The victories of Turenne in 1674 and 1675 were gained by a disobedience of the orders of the minister of war; but the desolation of the Palatinate was commanded by him. On the death of Colbert (1683), of whom he had been the enemy, his influence became still greater, and one of its most fatal effects was the revocation of the Edict of Nantes (1685), the *dragonnades*, and the consequent flight of so many peaceful and industrious Calvinists. The encroachments of France had eration. But, stirred by the lynching of a negro murderer by burning, he published an editorial which incensed the pro-slavery part of the community. Hostility was so violent that he removed the paper to Alton, Ill., where a mob threw his press into the river. He was presented with another by Alton friends, and 8 Sept. 1836 published the first issue of the Alton *Observer*. He soon took a bolder anti-slavery stand, and began to call for the organization of a State abolition society. Again, in August 1837, he was mobbed, his office wrecked, and the press destroyed, and when a new press was bought, the ruin was again repeated. The fourth press was set up in a warehouse under an armed guard; but during the night of 7 Nov. 1837 a score or two of men attacked the building, disregarded Lovejoy's warning, were fired upon, and one of the assailants was killed. An attempt was then made to set the warehouse on fire, and when Lovejoy was preparing to shoot the incendiary, he himself received a mortal gunshot wound. The mob then took possession of the place, and once more Lovejoy's press was destroyed. The whole country was excited by these events; public feeling was manifested in various ways; but the most significant effect of the tragedy was a more distinct arraying of forces for the «irrepressible conflict» which had already begun. Consult: J. C. and Owen Lovejoy's ‹Memoir› (1838); May, ‹Some Recollections of Our Anti-slavery Conflict› (1869); Tanner (one of the defenders of the warehouse), ‹The Martyrdom of Lovejoy› (1881); Garrison, ‹William Lloyd Garrison› (1885); and Martyn, ‹Wendell Phillips — the Agitator› (1890).

Lovejoy, Owen, American abolitionist: b. Albion, Maine, 1811; d. 1864. He was a brother of E. P. Lovejoy (q.v.); was educated at Bowdoin College; and in early life he removed to Alton, Ill. Entering the ministry of the Congregational Church, he preached and lectured against slavery with a power that roused his hearers and carried wide conviction. At Princeton, Ill., where he began a pastorate in 1838, he became conspicuous for the earnestness of his anti-slavery addresses, and for his persistence in holding anti-slavery meetings in defiance of legal and official prohibitions. In 1844 he was elected to the legislature, and resigned his pulpit. Elected to Congress in 1856, he participated in its most exciting debates until the time of his death. He was with his brother Elijah at Alton, Ill., 7 Nov. 1837, and was a witness of his tragic death.

Love'lace, Francis, American colonial governor: b. Hurley, Berkshire, England, about 1618; d. England about 1675. He was a younger son of the 1st Baron Lovelace and in 1668 succeeded Richard Nicolls as governor of New York. He oppressed the inhabitants by heavy taxation and became very unpopular. During his temporary absence from the town the Dutch fleet appeared in the harbor and the citizens speedily surrendered.

Lovelace, Richard, English lyrical poet: b. Woolwich, Kent, 1618; d. London 1658. He was educated at Oxford, entered the army and became a captain. He spent his fortune in support of the royal cause, and after entering into the French service, in 1648, returned to England, and was imprisoned until the king's death. His destitute condition at this time is in marked contrast to accounts of his handsome person and splendid appearance earlier in life. He died in great poverty. His poems, which are light and elegant, were published in 1659 under the title of ‹Lucasta.› The best known of his lyrics are ‹To Althea, from Prison,› and ‹To Lucasta, on Going to the Wars.› Lovelace, who for spirit and gallantry has been compared to Sir Philip Sidney, also wrote ‹The Scholar,› a comedy; and ‹The Soldier,› a tragedy.

Lov'ell, James, American patriot: b. Boston, Mass., 31 Oct. 1737; d. Windham, Maine, 14 July 1814. He was a son of John Lovell (q.v.), was graduated from Harvard in 1756 and taught in the Boston Latin School under his father in 1757-75. In 1771 he delivered the first anniversary oration on the so-called ‹Boston Massacre.› He was imprisoned by General Gage and carried to Halifax, but was exchanged in November, 1776, and sat in the Continental Congress 1776-82. He was collector of the port of Boston, 1788-9, and its naval officer, 1790-1814.

Lovell, John, American educator: b. Boston, Mass., 16 June 1710; d. Halifax, N. S., 1778. He was graduated from Harvard in 1728. The next year he was appointed usher in the Boston Latin School and was its master from 1734 till the siege of Boston caused its suspension, 19 April 1775. He was a rigid disciplinarian, but nevertheless genial and popular. A loyalist in his sympathies he went to Halifax on the evacuation of Boston by the English troops.

Love'man, Robert, American poet: b. Cleveland, Ohio, 11 April 1864. He was graduated from the University of Alabama. He has been a frequent contributor to magazines, and his verse is marked by simplicity and earnestness. He has published ‹Poems› in 1889, 1893, and 1897; and ‹A Book of Verse› (1900).

Lov'er, Samuel, Irish painter, novelist and poet: b. Dublin 1797; d. Saint Helier's, Island of Jersey, 6 July 1868. He first devoted his attention to painting, and in 1828 became a member of the Royal Hibernian Academy of Art. He afterward wrote novels, which he illustrated himself, dramas, operettas, and songs which he set to music of his own. In 1844 he gave a series of public entertainments called Irish evenings, which he repeated in the United States and Canada in 1846. Among his works are: ‹Legends and Stories of Ireland› (1832-4); ‹Rory O'More› (1837); ‹Songs and Ballads› (1839); ‹Handy Andy› (1842); ‹Treasure Trove› (1844). The ‹Angels' Whisper›; ‹Molly Bawn›; and the ‹Low-backed Car› are among his most popular songs. His works in 6 vols. with introduction by O'Donohue, were issued in New York in 1900, and with introduction by Roche, in Boston, 1902.

Lov'ering, Joseph, American scientist: b. Boston 1813; d. Cambridge, Mass., 1892. He was a graduate from Harvard, where he became Hollis professor of natural philosophy and mathematics in 1838, and continued to hold the position till 1888, when he was made professor emeritus. From 1884 to 1888 he was director of the Jefferson Physical Laboratory and he was also connected with the Harvard Observatory.

Lovering, William C., American politician and cotton manufacturer: b. Rhode Island 1837. He was educated at the Cambridge High School. He is president of the Whittenton Manufacturing Company, Taunton, Mass., sat in the State Sen-the Breviary hymn used in the vespers of Low Sunday, «Ad regias Agni dapes.» The name «Beloken Paschen,» close of Easter, is used frequently in Holland; and «Quasimodo,» the first word in the introit of the Mass for the day, is the common name for this day in Germany and France.

Lowe, Charles, English journalist and biographer: b. Balconnel, Forfarshire, Scotland. He was educated at the University of Edinburgh and on the Continent and was for 13 years *Times* correspondent at Berlin, returning to England in 1891. He has published two biographies of Bismarck: ‹Bismarck's Table Talk›; ‹Alexander III. of Russia›; ‹King Edward VII.›; ‹Our Greatest Soldiers›; etc.

Lowe, Sir Hudson, British general: b. Galway 28 July 1769; d. London 10 Jan. 1844. He entered the army at an early age; in 1813 was attached to the army of Blücher, and took part in the invasion of France in the early part of the following year. Appointed in 1815 to the command of the English troops which were to co-operate with the Austro-Sardinian army in Italy; on the fall of Napoleon he was appointed governor of St. Helena, and entrusted with the care of the ex-emperor. He returned to England in July 1821. He has been accused by the partisans of Napoleon for want of courtesy and for rigor and cruelty to his prisoner. It is, however, freely admitted that Napoleon and his suite made a system of exaggerating their grievances, and even sedulously tried to provoke them, with a view to exciting sympathy in Europe. Many of the grievances were puerile, as that Sir Hudson would not give Napoleon the title of emperor, which England had never recognized, and which he was forbidden by his government to use. Consult: Forsyth, ‹Captivity of Napoleon at Saint Helena from Letters and Journals of Sir Hudson Lowe› (1853); Seaton, ‹Sir Hudson Lowe and Napoleon› (1898); Lord Rosebery, ‹Napoleon, the Last Phase› (1900).

Lowe, John, American rear-admiral: b. Liverpool, England, 11 Dec. 1838. He was eduated in his native city and Columbus, Ohio, and entered the American navy in 1861. He served through the Civil War and accompanied the Greely Relief Expedition in 1884. He was the first naval officer of any nation to serve in a submarine torpedo-boat. This he did in 1898. He was promoted rear-admiral 11 Dec. 1900, and retired the same day. Since his retirement he has participated in an experiment with a submarine torpedo-boat, remaining submerged for 15 hours.

Lowe, Martha Ann Perry, American verse writer: b. Keene, N. H., 1829; d. Somerville, Mass., 1902. She published: ‹The Olive and the Pine› (1859); ‹Love in Spain, and Other Poems› (1867); ‹The Story of Chief Joseph› (1881); ‹Bessie Gray›; etc.

Lowe, Robert, Viscount Sherbrooke, English politician: b. Bingham, Nottinghamshire, 4 Dec. 1811; d. London 27 July 1892. He was educated at Winchester College and at University College, Oxford, and directly upon his admission to the bar in 1842 went to Australia, where he quickly attained prominence in political affairs. In 1843 he became a member of the Legislative Council of New South Wales, and made himself famous by his opposition to the land monopoly, as well as by the part he performed in the development of education and the regulation of finance. He also made effectual protest against the English practice of transporting convicts to Australia. Meanwhile he was not neglectful of his private affairs, but acquired great wealth, and returned to England in 1850. Two years later he was elected to Parliament for Kidderminster, and accepted the position of joint secretary of the board of control, and in 1859, under Palmerston, was placed practically at the head of educational affairs. In consequence of a mistaken vote of censure by the House of Commons in 1864 he resigned his office, but only to participate with ability more marked than before in the proceedings of that body. The rejection of the Whig Reform Bill in 1866 was considered to have been largely due to his powerful speeches against it. As one of the Adullamites (q.v.) he received overtures from the government of Lord Derby, but although he called himself an outcast from the Liberal party he refused to leave it. In 1867 he made a number of speeches designed to justify his opposition to extension of the suffrage. His strong support of the resolutions for disestablishment of the Irish Church, in 1868, restored him to favor in the Liberal party, and in December of that year he became chancellor of the exchequer under Gladstone, giving up that office in 1873 to accept the post of home secretary, in which, however, his tenure was brief. His reforms as chancellor of the exchequer related especially to reduction of sugar duties, the replacing of assessed taxes by license duties, and like readjustments. After the fall of the Gladstone ministry in 1874 Lowe took comparatively little part in public affairs. He was raised to the peerage as Viscount Sherbrooke in 1880. Consult: Parkes, ‹Fifty Years of Australian History› (1892); Martin, ‹Life of Lord Sherbrooke› (1893); Hogan, ‹Robert Lowe, Viscount Sherbrooke› (1893); also Hansard, ‹Parliamentary Debates.›

Lowe, Thaddeus S. C., American inventor and scientist: b. Jefferson, N. H., 20 Aug. 1832. He constructed balloons in 1856 and 1858–9 in order to study atmospheric phenomena, and during the Civil War was chief of the aeronautic corps. He devised a system of signaling in 1862, and valuable instruments for atmospheric investigation, etc., constructed and operated the largest aerostat ever built, invented a compression ice machine and made the first artificial ice in the United States (1865); and established the Lowe Observatory in the Sierra Madre Mountains, Cal.

Lowell, lō'ĕl, **Abbott Lawrence,** American educator and author: b. Boston 13 Dec. 1856. He was graduated from Harvard in 1877, from the law school of the university in 1880, was a legal practitioner in Boston in 1880–97, and from 1897 to 1899 was a lecturer at Harvard. In 1900 he was appointed there to the chair of the science of government. Among his works are: ‹Essays on Government› (1889); ‹Governments and Parties in Continental Europe› (1896), the only work of the sort in English, and a most careful and valuable explanation of the governmental machinery of European states; and ‹Colonial Civil Service› (1900).

of the same year. The poetic gifts and moral enthusiasm of this young woman quickened Lowell's nature, and gave his bent a purpose. In 1841 he collected some of his best poems into a volume called ‹A Year's Life,› and inscribed it in covert language to his betrothed. Two years later he began, with Robert Carter, the publication of a literary monthly, called ‹The Pioneer,› with Hawthorne, Poe, and Whittier among the contributors, but after three issues it was discontinued. In 1844 occurred his marriage with Maria White; and during the year were published an enlarged edition of the Poems, including ‹A Legend of Brittany,› ‹Prometheus,› ‹Miscellaneous Poems,› and ‹Sonnets,› and a volume called ‹Conversations on some of the Old Poets.› In 1848 he again published an edition of the Poems, with the addition of the Third Series, including several poems against slavery. Later in the year ‹The Vision of Sir Launfal,› ‹A Fable for Critics,› and ‹The Biglow Papers› came out, the last-named being a reprint of dialect poems furnished to the newspapers of the day. In nothing had Lowell been so effective as in these satires; nothing in the literature of those stirring times attracted more attention. In 1851 he sailed for Europe, with his wife, who was in failing health, and spent a year, mainly in Italy, in study and travel. After their return Mrs. Lowell's health did not improve, and in 1853 she died. A volume of her poems was printed, after her death, for private circulation. In 1855, on the resignation of Professor Longfellow, Lowell was elected Smith professor of the French and Spanish languages, and professor of belles lettres in Harvard College. He spent two years in Europe, to prepare himself more fully, and in 1857 took up the duties of his chair. He married Miss Frances Dunlap, of Portland, Maine, the same year. For the next 20 years his strength was taxed incessantly, being devoted, outside of his service in his college, to editorial and critical rather than poetic writing. He was the first editor of ‹The Atlantic Monthly,› and continued in the position for two years. He had an editorial connection with the ‹North American Review› from 1862 to 1873, and contributed to it many critical essays of unusual merit. In 1864 he reprinted, in ‹Fireside Travels,› a few papers of less substantial worth. In the lighter work of this busy period falls the ‹Biglow Papers,› Second Series, which he began in 1862. These were reissued in 1867. In the next year appeared ‹Under the Willows,› a collection of his poems written since 1848. In 1869 he published ‹The Cathedral,› over which he had long worked, and in 1870 ‹Among my Books,› a reprint of some of his best essays on literary themes. In 1871 followed ‹My Study Windows,› of like contents, and in 1876 ‹Among my Books,› Second Series. In 1877 Lowell was called to take the post of Ambassador to Spain, and after three years at Madrid was transferred to the court of St. James. Here he won the admiration not only of his countrymen, but also of the more exacting English public, by his executive abilities and his social and oratoric gifts. He received public honors from Oxford, Cambridge, Edinburgh and Bologna, and in 1883 was chosen Lord Rector by the University of St. Andrews. His residence at St. James terminated in 1885, and the affliction of his wife's death came to him, the same year, before return. He resumed to some degree his literary labors, after coming back to Cambridge. He published ‹Democracy, and other Addresses› in 1887, and ‹Heart's-ease and Rue,› and ‹Political Essays,› in 1888. He prepared the public address for the celebration of the 250th anniversary of the founding of Harvard University, and delivered a course of lectures on the Old English Dramatists before the Lowell Institute. In the year before his death he revised and edited a definitive edition of his writings in 10 volumes. Supplemental to these, ‹American Ideas for English Readers,› ‹Latest Literary Essays and Addresses, ›and ‹Old English Dramatists,› were issued posthumously in 1892. Lowell was first and chiefly a man of books, yet without bookishness or pedantry. The most scholarly of all the group then making a name in literature, he was also the most executive and practical. He never lost the point of view of life, never lost sympathy with people, and was perhaps as wise and strong in affairs as in the fields of textual and æsthetic criticism. He lacked the grace and tenderness of Longfellow, but was gifted with deeper insight than any other of the New England school save Emerson.

Consult: Lowell's ‹Letters,› edited by C. E. Norton (1894); Underwood, ‹Lowell, a Biographical Study› (1893); Scudder, ‹James Russell Lowell, a Biography› (1901); Hale, ‹James Russell Lowell and His Friends› (1899); E. E. Hale, Jr., ‹Lowell› in ‹Beacon Biographies›; Wendell, ‹Literary History of America› (1900).

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Lowell, John, American jurist: b. Newburyport, Mass., 17 June 1743; d. Roxbury, Mass., 6 May 1802. He was graduated from Harvard in 1760, studied law, entered practice at Newburyport in 1762, represented that town in the general court in 1777 and Boston in 1779, and was a delegate to the convention of 1780 which framed the constitution of Massachusetts. He obtained the insertion in this document of the clause of the preamble which declares that «all men are born free and equal,» with the belief that slavery would thus be abolished in Massachusetts. The supreme court of the State upheld his contention in 1783, and thereby slavery in the State was abolished at his initiative. In 1782–3 he was a delegate in the Continental Congress, and in 1782 was appointed by the congress one of three judges of a court of appeals to hear appeals from courts of admiralty. He was made by Washington in 1789 judge of the United States district court of Massachusetts, and by Adams in 1801 chief justice of the 1st circuit of the United States circuit court. He was a founder of the American Academy of Arts and Sciences (1780), and one of its councillors. He published an oration on James Bowdoin the elder in Vol. II. of the ‹Memoirs› of the American Academy; and a poem in ‹Pietas et Gratulatio› (1761).

Lowell, John, American publicist: b. Newburyport, Mass., 6 Oct. 1769; d. Roxbury, Mass., 12 March 1840. He was a son of John Lowell (1743–1802) (q.v.). He was graduated from Harvard in 1786, studied law, was admitted to the bar in 1789, retired from practice in 1803, and after travel in the East (1803–6) devoted his attention to literature. He wrote on agriculture

turn the wheels for the mills in Lawrence, Haverhill and Newburyport. Coal is so expensive in Lowell that water-power is used extensively; but the large mills are fitted with steam-power machinery that may be used in a dry season.

Some of the manufacturing establishments are woolen and cotton factories, hosiery and knitting mills, carpet and felt factories, bleacheries, dyeing works, machine-shops, patent-medicine works, a cartridge factory, and furniture factories. Lowell has many points of historic and scenic interest and a number of fine public buildings. The educational institutions are the State Normal School, the Rogers Hall School, the Lowell Textile School, Saint Patrick's Academy, a high school, and public and parish elementary schools. The city has the Lowell Hospital, Lowell General Hospital, Saint John's Hospital, Saint Peter's Orphanage, Theodore Edson Orphanage, Ayer Home for Young Women and Children, Saint Patrick's Home for Working Women, and the Old Ladies' Home.

The annual amount of municipal expenditures is about $1,320,000; the principal items are: for schools about $330,000; for hospitals, almshouses, etc., $120,000; for police department, $121,000; for the fire department, $118,000; for municipal lighting, $84,500; for waterworks, $85,000. The waterworks were built in 1873 at a cost of about $2,875,000. There are now about 130 miles of mains. The waterworks are owned and operated by the city. Pop. (1890) 77,696; (1900) 94,969, about 44 per cent of whom are of foreign birth, many from Canada. Consult: Drake, 'History of Middlesex County'; 'Illustrated History of Lowell.'

Lower California. See CALIFORNIA, LOWER.

Lowndes, Lloyd, American capitalist and politician: b. Clarksburg, W. Va., 21 Feb. 1845; d. Cumberland, Md., 8 Jan. 1905. He was graduated from Alleghany College, Meadville, Pa., and from the law school of the University of Pennsylvania. He entered the Maryland legislature in 1871 as a Republican, and from 1895-9 was governor of Maryland.

Lowndes, Marie Adelaide Belloc, English author; b. 1868. She is a sister of Hilaire Belloc (q.v.) and was married to F. S. Lowndes in 1896. She has published 'Life and Letters of Charlotte Elizabeth, Princess Palatine' (1889); 'King Edward VII.' (1901); 'The Philosophy of the Marquise,' a novel in dialogue (1899).

Lowndes, Rawlings, American statesman: b. in the West Indies 1722; d. 1800. His parents removed with him to Charleston when he was very young, and his career was ever after associated with that city. Having studied law he became an associate judge of the colonial court in 1766, and in that position opposed the Stamp Act. He assisted in outlining a new constitution for South Carolina in 1776, and in 1788 became president of the State. He was subsequently a member of the State legislature and vigorously opposed the ratification of the Federal constitutions.

Lowth, Robert, English prelate and biblical scholar: b. Winchester, Hampshire, 27 Nov. 1710; d. London 3 Dec. 1787. Educated at Winchester School and Oxford University, he became professor of poetry in the latter in 1741, and in 1744 was appointed rector of Ovington, Hampshire. In 1753 he published his lectures on 'The Sacred Poetry of the Hebrews,' and became famous as one of the first biblical critics of his age. Ecclesiastical preferments followed, and he was made successively prebend of Durham, bishop of St. David's, (1766), of Oxford the same year, and of London in 1777. In 1783 he declined the archbishopric of Canterbury. In 1778 he published 'Isaiah, a New Translation,' with a preliminary dissertation and notes, which was highly commended.

Lowville, lō'vĭl, N. Y., village, county-seat of Lewis County; on the New York Central & Hudson River railroad; about 100 miles northwest of Albany and 60 miles north by west of Utica. It is situated in an agricultural section, and the industries of the village are connected chiefly with farm and dairy products. Its trade is principally in hay, grain, vegetables, and the noted Lewis County butter and cheese. The principal buildings are the town-hall, the county buildings, a club-house, and the Lowville Academy. The academy library has about 4,500 volumes. Pop. (1900) 2,352.

Loxodrom'ic Curve, the course which is represented by the path of a ship when her course is directed constantly to the same point of the compass, thereby cutting all the meridians at the same angle.

Loy, Matthias, American Lutheran theologian: b. Cumberland County, Pa., 17 March 1829. He was graduated from the Theological Seminary at Columbus, Ohio, in 1849, and was pastor at Delaware, Ohio, 1849-65. He was editor of the 'Lutheran Standard' (1864-91), and president of the Evangelical Lutheran Synod of Ohio 1860-78, and 1880-94. He has published 'The Doctrine of Justification' (1869); 'Christian Prayer' (1890); 'The Christian Church' (1898); etc.

Loyal Legion of the United States, Military Order of the, was the first society formed by officers in the Civil War, who were honorably discharged. Members are eligible from the army, navy and marine corps. On the day after the assassination of President Lincoln, Col. S. B. Wylie Mitchell, Capt. Peter D. Keyser, M. D., and Lieut.-Col. T. Ellwood Zell met in Philadelphia to arrange for a meeting of ex-officers of the army and navy to adopt resolutions relative to the death of President Lincoln. It was decided to effect a permanent organization, and an adjourned meeting was held for this purpose in the hall of the Hibernia Fire Company in Philadelphia 3 May 1865. There are State commanderies in Pennsylvania, New York, Maine, Massachusetts, California, Wisconsin, Illinois, District of Columbia, Ohio, Michigan, Minnesota, Oregon, Missouri, Nebraska, Kansas, Iowa, Colorado, Indiana, Washington, and Vermont. The total membership in 1902 was over 10,000.

Loyal Temperance League, an organization of children founded in 1886, by the Woman's Christian Temperance Union, for the purpose of teaching children the evil effects of alcohol and tobacco. The graduates, who follow a systematic course of instruction, are organized into State legions, holding annual conventions. There are upward of 200,000 members in the United States.

Loy'alists, or Tories, in American history, were those persons who remained loyal to Great Britain, during the Revolutionary War. They represented all classes, a majority of them, however, being office holders and members of learned professions. Others were adventurers who adhered to England with the hope of gain or official preferment. At the close of the Revolution the Royalists were estimated at 1,000,000 or a third of the entire population of the colonies. The Whigs took vigorous action against the loyalists, banished many of them under penalty of death and confiscated the estates of others. Between 40,000 and 50,000 loyalists are said to have fled to Canada prior to 1786. Consult: Ryerson, 'Loyalists of America, 1620–1816,' (1880); Van Tyne, 'The Loyalists in the American Revolution' (1902).

Loy'alty Islands, a group in the Pacific Ocean, east of New Caledonia, of which French colony they form a dependency. They consist of the islands Uvea (Uea), Lifu, and Marè, with many small islands. Total area, about 1,040 square miles. Water is scarce, but some fruits, vegetables, and grains are cultivated. The inhabitants are of mixed descent, Melanesian and Polynesian, and nearly all Protestants. Pop. about 20,000.

Loyola, lō-yō'lä, **Ignatius** (Inigo Lopez de Recalde), founder of the order of the Jesuits: b. at the castle of Loyola, Guipuzcoa 1491; d. Rome 31 July 1556. He seems to have been from the first of an enthusiastic temperament, which was fomented by the Spanish romances, in which religion and chivalry are blended, and is said in early youth to have himself written a romance of which the apostle Peter was the hero. In 1505 he became attached as a page to the household of Ferdinand V. His relative Don Antonio Manriquez, duke of Najara, trained him to the profession of arms and his valor was indicated at the siege of Pampeluna, on the occasion of the invasion of Navarre by Francis I. in 1521, when the garrison was induced to hold out by his example alone. Loyola was made a prisoner by the French, having been wounded in both legs by a cannon ball in such a manner as to render him lame for life. He had twice to undergo a painful operation, followed by a long confinement. The only books he found to relieve its tedium were books of devotion and the lives of saints. This course of reading threw him into a state which he has minutely described in his 'Spiritual Exercises,' a devotional book written in Spanish, and which has been translated into many languages. His ambition now turned from a military life, for which he was incapacitated, to imitation of the self-denial of Saint Dominic and Saint Francis. He made pilgrimage to Montserrat in Catalonia, where he hung up his arms before the Virgin and assumed the pilgrim's staff. After dedicating himself to the church at Montserrat he proceeded to the hospital of the Dominican convent of Manresa, where he devoted himself to the care of the poor and sick. After ten months spent at Manresa he proceeded on a pilgrimage to Rome and Jerusalem (1523). His object at this time was the conversion of the infidels, but being refused a permanent residence at Jerusalem by the primate of the church he returned to Spain and attended (1524–7) the schools and universities of Barcelona, Alcala, and Salamanca. In Spain he was several times arrested by the Inquisition under suspicion of heresy, but was always acquitted. He then went to Paris, where, placing himself in the lowest classes, he went through, from 1528 to 1535 a course of general and theological training. Here he formed the first nucleus of the society which afterward became so famous. Under his influence Pierre Le Fèvre, a Savoyard priest, Francis Xavier; professor of philosophy, Lainez, Salmeron, Bobadilla and Rodriguez of Azevedo, students, met together with Loyola on 15 Aug. 1534, in a subterranean chapel of the Abbey of Montmartre, took the sacrament administered by Le Fèvre, and bound themselves together by vows of chastity and poverty, devoting themselves to the care of the church and the conversion of infidels. In 1536 he met the members of this body at Venice with a view to the pilgrimage to Jerusalem, but the war which broke out in 1537 between the Venetians and the Turks prevented the accomplishment of this object. At Venice Loyola became attached to Cardinal Caraffa (Paul IV.), the founder of the order of the Theatines, and proceeded to Rome to procure the recognition of his order, which was granted partially in 1540, and fully three years later, taking the name of the Company of Jesus. Besides the vows of poverty and chastity their vow of obedience bound them to perform unhesitatingly all the commands of the pope. They discarded the peculiar garb by which monastic orders were usually distinguished, and devoted themselves to the highest objects to which a religious society could aspire — the education of youth, the defense of the church, and the propagation of the faith. Besides missionary enterprises for the extension of the church, their chief means of influence were the pulpit, the confessional, and their schools and colleges for training the young. Thus the romantic devotion of Loyola took a practical shape. On 22 April 1541 Loyola was elected general of the order, and drew up its constitution, assisted by the organizing genius of Laynez. He continued to reside in Rome and govern the society he had constituted till his death. He died worn out with the fatigues of his ascetic severities on 31 July 1556. He was beatified in 1607 by Paul V., and canonized in 1622 by Gregory XV. See Jesuits.

Loyson, Charles, shärl lwä-zôṅ (known by his monastic name, Père Hyacinthe), French ecclesiastic: b. Orléans 10 March 1827. He studied in the College of Pau and the ecclesiastical college of Saint Sulpice, was ordained priest in 1850, taught philosophy at the seminary of Avignon and theology at that of Nantes, entered the Carmelite order, and became renowned as a preacher at Lyons, Bordeaux, Nantes, and Paris. But his unorthodox utterances soon drew the censure of ecclesiastical authority, and his superiors prohibited him from preaching. He then left the Order, and refusing to remain silent, he was excommunicated. In 1869 he visited the United States, where he was heartily welcomed. He protested against the dogma of papal infallibility, attended the Old Catholic congress in Munich, and to some extent fraternized with Protestants, but he repeatedly declared that he had no intention of leaving the Catholic Church. In 1873 he became pastor of an Old Catholic church at Geneva, and thus the founder of the Christian Catholic Church of Switzerland. In 1878 he opened in Paris an independent church, the Eglise Gallicane. Among his writings are: 'Le Dimanche et les Classes laborieuses'; 'L'Eglise catholique en Suisse'; 'La Réforme catholique,' and other works.

Lozier, lō'zhėr, **Clemence Sophia** (Harned), American physician: b. Plainfield, N. J., 11 Dec. 1812: d. New York 26 April 1888. In 1829 she was married to A. W. Lozier; in 1849 began the study of medicine, and in 1853 was graduated from the Syracuse Medical College. She entered practice in New York, and there had great success as a surgeon. The New York medical college and hospital for women was founded largely through her efforts, and for many years she was a professor in that institution and dean of its faculty. She was also for four years president of the National Woman Suffrage Society. She was a prominent woman suffragist and active in reform and philanthropic movements.

Lualaba, loo-ā-lä'bä, Central Africa, a head-stream of the Kongo River, which rises near Kabinda on the southern boundary of the Kongo Free State, receives several affluents such as the Lufira and Lubudi, passes through a hilly, forest and lake region, and after a course of about 650 miles, the last 250 of which are navigable, unites with the Luapula (q.v.) at Ankoro to form the Kongo.

Luapula, loo-ä-poo'lä, Central Africa, a river, the chief of the two principal head-streams of the Kongo. It rises as the Chambezi south of Lake Tanganyika, near Fwamba on the Stevenson Road, flows southwest through Lake Bangweolo whence it issues as the Luapula, flows northward through Lake Moero, then northwestward until it unites at Ankoro with the Lualaba (q.v.) to form the Kongo.

Lubang, loo-băng', Philippines, the largest and only inhabited island of the group of the same name lying at the western entrance of the Verde Passage between Luzon and Mindoro, southwest of Manila. The island of Lubang is 17 miles in length from northwest to southeast; area, 51 square miles; area of group 76 square miles. The interior of the island is mostly mountainous, but the coasts are low. The chief town is Lubang on the north coast, which has considerable native trade; the only port safe for all vessels at all seasons of the year is Tilig, on the northeast coast. Civil government was established in these islands in 1901, and in June 1902 they were detached from the province of Cavite and annexed to the province of Marindique. Pop. 3,000.

Lubao, loo-bä'ō, Philippines, a pueblo of the province of Pampangas, Luzon, situated on the northwestern channel of Pampanga delta, 5 miles south of Bacolor. It is the trade centre of an agricultural region. Pop. 21,200.

Lubbock, lŭb'ŏk, **Francis Richard**, American politician: b. Beaufort, S. C., 16 Oct. 1815. He early entered a mercantile career, went to Texas in 1836, held the office of comptroller under the republic of Texas, in 1856 became lieutenant-governor of Texas, and was its governor in 1861–3, whence he was known as the «war governor.» Subsequently he entered the Confederate service, became colonel of cavalry, was aide-de-camp to President Jefferson Davis and was captured with Davis and imprisoned for eight months in Fort Delaware. He wrote ‹Six Decades in Texas› (1900).

Lubbock, John, Baron Avebury, British archæologist and man of science: b. London 30 April 1834. He was educated at Eton and joined the banking business of his father, Sir John William Lubbock (q.v.) in 1848, becoming a partner in 1856. He rose to great eminence in his profession, and was appointed tc various honorable and responsible posts in connection with it. He entered Parliament in 1870 for Maidstone in the Liberal interest, and from 1880 till 1900 sat for London University, from 1886 as a Liberal Unionist. In 1900 he was raised to the peerage as Baron Avebury. He is a recognized authority on financial and educational questions, and his name is associated with several important public measures, such as the bank holidays, ancient monuments, shop hours, and public libraries acts. He is still more distinguished as a man of science. His studies have been chiefly directed toward the ancient remains and history of mankind; and the habits of insects, particularly of wasps, ants, and bees. Among his volumes are: ‹Prehistoric Times› (1865); ‹Origin of Civilization› (1870); ‹Origin and Metamorphoses of Insects› (1874); ‹British Wild Flowers in their Relation to Insects› (1875); ‹Addresses: Political and Educational› (1879); ‹Ants, Bees, and Wasps› (1882); ‹Representation› (1885); ‹Flowers, Fruits, and Leaves› (1886); ‹The Pleasures of Life› (1887); ‹The Senses, Instincts, and Intelligence of Animals› (1889); ‹The Beauties of Nature› (1892); ‹The Use of Life› (1894); ‹The Scenery of Switzerland› (1896); and ‹Buds and Stipules› (1898), besides a large number of papers in the transactions of learned societies. He has done much to promote a popular interest in matters of science, not only by making more accessible the work of others, but by extensive personal investigation. He presided over the York meeting of the British Association in its jubilee year (1881), and the address he delivered on that occasion was published separately under the title ‹Fifty Years of Science.› He is connected with a large number of scientific bodies both in the United Kingdom and on the Continent.

Lubbock, Sir **John William**, English astronomer and mathematician: b. Westminster, London, 26 March 1803; d. 20 June 1865. He was graduated from Trinity College, Cambridge, in 1825; became a banker; found an avocation in scientific studies; made particular investigations in physical astronomy and Laplace's theory of probability; was treasurer and vice-president of the Royal Society in 1830–5 and 1838–47; and was the first vice-chancellor of London University (1837–42). Among his writings are: ‹An Elementary Treatise on the Computation of Eclipses and Occultations› (1835); ‹An Elementary Treatise on the Tides› (1839); and ‹On the Gnomonic Projection of the Sphere› (1851).

Lü'beck, Germany, one of the three free city-states (see Free Cities), and a constituent of the German confederation, situated on a low ridge at the confluence of the Wackenitz with the Trave, 38 miles northeast of Hamburg, and 12 miles from the Gulf of Lübeck, on the Baltic. It was anciently surrounded by walls and bastions, which have been leveled and converted into pleasant walks; but it is still entered by four gates, and furnishes striking specimens of the architecture of the 15th and 16th centuries. Among the buildings are the cathedral, a structure of red brick, begun in 1173, surmounted by two spires 416 feet high, and containing a finely carved choir-screen; the Marienkirche (St. Mary's Church), a fine specimen of early Gothic, the Ægidienkirche (St. Giles' Church) and the Petrikirche (St. Peter's Church); the town or senate house, an ancient Gothic building; the Hospital of the Holy Ghost (13th century); the Holstein Gate, with its two lofty towers, etc. There is a public library of about 100,000 volumes. The city has fine municipal waterworks, electric lighting and a system of electric street railroads connecting the suburbs. The manufactures are comparatively unimportant, but the trade is extensive, especially with Hamburg, the Baltic ports, and the interior of Germany. Lübeck possesses a territory of 116 square miles, and includes the port of Travemünde, and several isolated portions in Holstein and Lauenburg. It has a senate of 14 members and a council of burgesses of 120 members. It became an imperial free city in 1226, and about 30 years later it became the head of the Hanseatic League. It is represented by one member in the Bundesrat and one in the Reichstag (q.v.). Pop. of city (1900) 82,098; of city and state 96,755.

Lübke, Wilhelm, vĭl'hĕlm lüb'kė, German historian of art: b. Dortmund, Westphalia, 17 Jan. 1826; d. Karlsruhe (Baden) 5 April 1893. He studied at Bonn and Berlin; held the chair of architecture at the Building Academy of Berlin in 1857–8; was professor of the history of art and archæology at the polytechnic school at Zürich 1861–6; at Stuttgart, 1866–85; and at the high school in Karlsruhe, 1885–93. Chief among his works are: ‘Mediæval Art in Westphalia’ (1853), which at once gave him a high place among art-critics; the ‘History of Architecture’ (‘Geschichte der Architektur’ 1855), the first popular manual of the subject, and a great success; ‘Outlines of the History of Art’ (1860, 11th ed. 1891), translated into English by Clarence Cook, 1880; ‘History of the Renaissance in France’ (1868); ‘History of the Renaissance in Germany’ (1873); ‘History of German Art’ (1888); ‘Recollections’ (1891). He was extremely versatile, and previous to his work in art, gave instruction in vocal and pianoforte music.

Lublin, loo'blĭn, Russian Poland, capital of the government of Lublin; on the Bistritza, about 95 miles southeast of Warsaw. Lublin was, in the 12th century, a place of importance. The union of Poland and Lithuania was decreed at a diet which met here in 1568. There are at present some manufactures, chiefly woolen goods, agricultural implements, and leather. There is a jail with which is connected a government cloth-factory. Lublin has several good educational institutions and a number of ancient buildings. Pop. about 52,000, one half of whom are Jews.

Lu'bricant, any substance applied to machinery or any rubbing surfaces to diminish friction. Lubricants fill the interstices between the particles of the surfaces in contact, and so prevent their interlacement. Tallow is used where the rubbing surfaces are of metal and wood, and even when they are both metal, if they happen to be rough. Oil is more commonly employed for metal surfaces, and the harder and smoother the surfaces, the finer must be the oil. Powdered plumbago has been used for highly polished surfaces. Water is found to be a good lubricant at all rubbing surfaces which happen to be under water. Very many other substances are also in use as lubricants, such as cottonseed oil, olive oil, sperm oil, castor oil and other vegetable oils. Hard lubricants include graphite and soapstone. See also OILS.

Lucan, lū'kạn (MARCUS ANNÆUS LUCANUS), Roman poet: b. Corduba, Spain, 39 A.D.; d. 65. His father, a Roman knight, was the youngest brother of the philosopher Seneca. Lucan went to Rome when a child, and having early obtained celebrity, was forbidden by Nero, who himself aspired to literary honors, to recite in public. This induced Lucan to join the conspiracy of Piso. The plot was discovered, and Lucan, who is said to have informed against his own mother as accessory, was condemned to death. He chose the death of Seneca, and had his veins opened. Of his poems, only his ‘Pharsalia’ has come down to us, in which he narrates, in ten books, the events of the civil war between Cæsar and Pompey. The poem is unfinished, and as it appears to have been produced at different times, it is uncertain whether it was left unfinished by the author or whether the latter part has been lost. In the earlier portions the liberal sentiments of the author are checked by deference to the emperor, in the latter he is inveighed against in unsparing language. The best editions are Burmann's (Leyden, 1740), Weber's (Leipsic, 1821–31), and those of Haskins (Cambridge, Eng., 1887), Hosius (Leipsic, 1892), and Francken (Leyden, 1896–7). Lucan has been translated into English by Rowe (1718) and by Riley (1853).

Lucania, lū-kā'nĭ-ạ, Italy, a district of ancient Italy, corresponding nearly to the present province of Potenza and the eastern part of Salerno. The region was mountainous, and covered with extensive forests. The Chones and the Œnotrians were the ancient people of this section; but before the introduction of Christianity into Italy, they had been nearly destroyed. Lucania became Roman territory about 300 B.C.

Lucas, lū'kas, **Daniel Bedlinger,** American lawyer and author: b. Charlestown, W. Va., 16 March 1836. He was graduated from the University of Virginia (Charlottesville, Va.), in 1856; in law from Washington College (Lexington, Va., now Washington and Lee University) in 1858; in the Civil War served in the Confederate army on the staff of Governor Wise of Virginia in the Kanawha Valley, and from 1867 practised law at Charlestown. In 1884–7 he was a member of the West Virginia legislature; in 1887-8 was a United States senator under appointment of the governor; and in 1888–93 was president of the supreme court of appeals of West Virginia. He was a presidential elector on the Democratic ticket in 1872, 1876, 1884, and 1896. He obtained in the South a considerable reputation as a public speaker, and published a ‘Memoir of John Yates Bell’ (1865); ‘Nicaragua and the Filibusters’; and, in verse, ‘The Wreath of Eglantine and other Poems’ (1869); ‘The Maid of Northumberland: A Dramatic Poem’ (1879); and ‘Ballads and Madrigals’ (1884).

Lucas, Edward Verrall, English author: b. 12 June 1868. He was connected with the London ‘Globe’ 1893–1900 and with the ‘Academy’ 1896–1901. He has published a popular ‘Book of Verses for Children› (1897), as well as other works for young readers; ‹The Open Road› (1899); etc.

Lucas, John Seymour, English artist: b. London 21 Dec. 1849. He studied with the wood-carver Gerard Robinson; and painting at the Royal Academy; first exhibited at the Academy in 1872; first made his mark by his ‹By Hook or Crook,› shown at Burlington House in 1875; and obtained recognition for the high technical excellence of his work. Among his later canvases are ‹Fleeced›; ‹For the King and the Cause›; ‹Intercepted Despatches›; ‹Charles Before Gloucester›; ‹After Culloden›; ‹The Call to Arms.›

Lucbán, look-bān′, or **Lugbang,** loog-bāng′, Philippines, pueblo of the province of Tayabas, Luzon, 8 miles northwest of Tayabas, the provincial capital. It is in the heart of a mountainous region, and in the surrounding country rice is grown on *sawas* or terraces on the hillsides. It is on the main road, and has a profitable trade. The chief industries are the weaving of fine straw hats from the fibre of the buri palmleaf, and the manufacture of pandanus mats. Pop. 12,800.

Lucca, look′kä (originally Lucas), **Pauline,** Austrian opera singer: b. Vienna 25 April 1842. She made her first appearance in opera in 1859 as Elvira in Verdi's ‹Ernani› at Olmütz; at once attained great success on the Continent; and later sang in London (1863–5) and New York (September 1872). Illness impaired her voice and in 1889 she retired. Among her chief parts were those of Margaret, in ‹Faust›; Cherubino, in ‹Le Nozze di Figaro›; and Zerlina in ‹Fra Diavolo.›

Lucca, Italy, the capital of the province of Lucca, and former capital of the ancient Tuscan republic and duchy of Lucca, near the left bank of the Serchio, 37 miles by rail northwest of Florence. Encircled by walls flanked with bastions, it stands in a fertile plain surrounded by the Apennines, and has a striking appearance. It is entered by four gates and is well built. Lucca is an archiepiscopal see, and the seat of several important courts and public offices. It contains numerous antiquities; one of the most interesting is the fish-market, the large oval of which is the Roman amphitheatre; while the buildings around it, though converted into modern dwellings, are in a great measure composed of the ruins of the amphitheatre, and exhibit huge solid arches, and masses of brick and stone, on their original sites. The principal edifices are the *Duomo,* or cathedral, with a magnificent façade, a Romanesque portico, and stained glass of the richest kind; the Church of San Michele, an ancient and imposing structure; the Church of San Frediano, founded in 686, furnishing an interesting specimen of early Christian architecture, and adorned with fine mosaics, frescoes, and paintings; the ducal palace; the Palazzo Borghi, now converted into a poor-house; and an aqueduct, carried from a distance into the city, over 459 arches. The manufactures consist chiefly of silk goods; and there are numerous silk mills. The trade is almost confined to the above articles of manufacture, agricultural produce, and olive-oil, particularly the latter, which bears a high name, and is largely exported. Pop. of commune (1901) 74,971.

First an Etruscan, then a Ligurian town, Lucca 177 B.C., became a Roman colony. It followed the varied fortunes of northern Italy until about 1115 it was made the seat of a republic. In 1320 it fell under the dominion of Castruccio Castracani, who became Duke of Lucca, and after his death Lucca was sold to Florence. It purchased its liberty from Charles IV. in 1369, and maintained its independence until the French occupation in 1799. In 1814 the Congress of Vienna re-created it a duchy. It became part of the kingdom of Italy in 1860.

Luce, Stephen Bleecker, American naval officer: b. Albany, N. Y., 25 March 1827. He was appointed midshipman from New York in 1841; saw service in various waters and made the circuit of the globe; during the Mexican War was on the Pacific coast; and in the Civil War was commander of the monitor Nantucket, and of the Sonoma, Canandaigua, and Pontiac. In 1884–6 he was president of the naval war college, and in 1886–9 was in command of the North Atlantic station as head of the rear-admirals on the active list. On 25 March 1889 he was retired. He was an associate editor of the ‹Universal Cyclopædia,› naval editor of the ‹Standard Dictionary,› and
of ‹Seamanship› (1863–98), ‹Naval
(1889), and ‹The Patriotic and Naval So

Lucena, loo-thā′nä, Spain, an And
city in the province of Cordova, 30 mile
east of that city, in a picturesque hilly s
It is well built, has a fine parish church,
benevolent institutions, a town-house,
nificent «paseo» or public promenade, an
neighborhood are medicinal baths of re
manufactures linens, shoes, earthenware
iron, copper, and other metallic vessels,
egar, brandy, and is in a region noted
wines, and for stock-raising. Pop.
21,294.

Lucerne, lū-sėrn′ (Fr. lū-sārn), Switzerland, the capital of the canton of Lucerne, and one of the three seats of the Swiss diet, on an acclivity at the west end of Lake Lucerne. The Reuss, which issues from the lake and flows through the town, is crossed by five bridges, two of which are covered and ornamented with curious mediæval paintings, including a Danse Macabre. The town retains its feudal walls and watch-towers, and with the neighboring mountains, including the Pilatus and Rigi, is noted for its picturesque features and scenic beauties, making it a much-frequented tourist centre. Lucerne is well-built, has regular, clean streets, electrically lighted and traversed by street railroads, a town-hall, with collections in art and antiquities; Jesuit college, now the government building; a 15th century parish church, with two slender towers; a Gothic Protestant church; Ursuline convent, with handsome church; a museum and cantonal library of 90,000 volumes; large town hospital, poor-house, deanery, arsenal, a new International Museum of War and Peace, mint, casino, etc.; and besides the college or lyceum, several well-conducted educational establishments. An interesting monument is the ‹Lion of Lucerne,› designed by Thorwaldsen, in memory of the Swiss guards who fell in Paris in 1792 while defending the Tuileries, and hewn out of the solid rock. Lucerne has some transit trade, but the manufactures are unimportant; it depends chiefly on the important tourist traffic, accommodating annually over 100,000 visitors. Pop. (1900) 29,255.

Lucerne, Lake of, or **Vier-Waldstättersee** (Lake of the Four Forest Cantons), Switzerland, the largest, and in many respects the most magnificent, Swiss lake, near the centre of the country, 1406 feet above sea-level, surrounded by the cantons of Lucerne, Schwyz, Uri, and Unterwalden. It is irregular in shape, and divided into reaches, separated by narrow straits, giving it the appearance of three distinct lakes. The extreme length from west to south through its centre is 25 miles; average width, 3 miles; extreme width, 9 miles; while the depth varies from 300 to 900 feet. It presents every variety of lake scenery. In the upper reach, lofty mountain masses, including Pilatus and the Rigi, tower above the lake, and descend in sheer precipices to its very edge. Owing to the violent storms which suddenly burst over the lake, its navigation is dangerous. Steamers ply regularly upon it. The Reuss River enters the lake at Flüelen and flows out of it at Lucerne. Cut out of the solid rock on the eastern shore is the Axenstrasse, one of the most beautiful of lake-shore roads.

Lucerne, the European term for the fodder plant called in America alfalfa (q.v.).

Luchaire, Achille, ä-shēl lü-shär, French historian: b. Paris 24 Oct. 1846. He was at first professor in the Bordeaux faculty of letters, and in 1885 was made a professor at Paris, where in 1889 he obtained the chair of mediæval history. In addition to studies of the Basque language, such as ‘Noms de Lieux du Pays Basque’ (1872), and ‘De Lingua Aquitanica’ (1877), he published a comprehensive work on the Gascon dialects, ‘Etudes sur les Idiomes pyrénéens de la Région française’ (1879), crowned by the Academy, and several historical narratives, such as ‘Institutions monarchiques de la France sous les premiers Capétiens’ (1884), and ‘Les Communes françaises à l'Epoque des Capétiens directs’ (1890).

Lucian, lū'shĭ-ạn, Greek author: b. Samosata, Syria, about 125 A.D.; d. Egypt toward the close of the 2d century A.D. He went to Antioch and devoted himself first to the law and afterward to rhetoric, and traveled in several countries (among others, Greece, Italy, Spain, and Gaul) as a lecturer. On returning home, probably about his 40th year, he abandoned the profession of rhetoric, which he seems partially to have resumed in his old age, and confined himself to philosophy and literature. He lived to an advanced age, and was at a late period of his life made procurator of part of Egypt. The works of Lucian, of which many have come down to us, are narrative, rhetorical, critical, satirical, mostly in the form of dialogues. The most popular are those specifically known as the ‘Dialogues,’ in which he derides the popular mythology and the philosophical secrets, particularly his ‘Dialogues of the Gods’ and ‘Of the Dead.’ These have given him the character of the wittiest of ancient writers. He seems not to belong to any system, but attacks imposture and superstition freely and boldly where he finds them. The Epicureans, who, in this respect, agree with him, are therefore treated with more forbearance. The Christian religion, of which, however, he knew little, and that only through the medium of mysticism, was an object of his ridicule. His writings were once largely studied as text-books, but his diction is not of the best. Among editions of his works may be mentioned Lehmann's (1822–9), F. Fritsch's (1882–5), incomplete; and Sommerbrodt's (1886–99). The most complete English translation is by Howard Williams (1888, in Bohn's series), and there are also renderings by Francklin (1781) and Tooke. Consult: Croiset, ‘Essai sur la Vie et les Œuvres de Lucien’ (1882).

Lucifer, lū'sĭ-fėr, (1) in ancient astronomy, the morning star. A name given to the planet Venus when she appears in the morning before sunrise. When Venus follows the sun, or appears in the evening, she is called Hesperus, the evening star; (2) a name commonly given to Satan, the prince of darkness; (3) a term originally applied to matches tipped with a mixture of chlorate of potash and sulphuret of antimony, which were inflamed by friction on a piece of emery paper. These have been superseded by a variety of mixtures containing phosphorus.

Luciidæ, lū-sī'ĭ-dē, or **Esocidæ,** the pike and pickerel family of bony fishes. These fishes have an elongated, somewhat compressed, powerful body, with rather small cycloid scales, an imperfect lateral line; the head and snout prolonged and depressed, the mouth large, and lower jaw longest. The mouth is filled with strong teeth, and these fishes are the fiercest carnivores of the fresh waters. The family is widely distributed in Northern waters, and may be traced back to the Miocene Age. See Pike.

Lucile, lū-sēl', an epic poem by Lord Lytton (q.v.) (Owen Meredith) published in 1860. The narrative was founded upon a French novel.

Lucilius, lū-sĭl'ĭ-ŭs, **Gaius,** Roman author: b. Suessa 180 B.C.; d. Naples 103 B.C. He was grand-uncle to Pompey the Great on the maternal side. He served his first campaign against Numantia under Scipio Africanus, with whom he was very intimate. He is considered the inventor of the Roman *satira,* because he first gave it the form under which this kind of poetry was carried to perfection by Horace, Juvenal, and Persius. His satires were superior, indeed, to the rude productions of Ennius and Pacuvius, but he in turn was surpassed by those who followed him. Horace compares him to a river which carries along precious dust mixed with useless rubbish. Of thirty books of satires which he wrote only 940 fragments have been preserved. In his lifetime these satires had an uncommon popularity. Consult the edition by Lachmann and Vahlen (1876); also Müller, ‘Leben und Werke des Gaius Lucilius’ (1876).

Lucina, lū-sī'nạ, in Roman mythology, the goddess of light, a surname of Juno (according to some of Diana; according to others the name of a daughter of Jupiter and Juno), derived from the root of *luceo* (I shine). Her festival was celebrated 1 March, on which occasion the matrons assembled in her temple, adorned it with flowers, and implored a happy and brave posterity.

Lucius, lū'shĭ-ŭs, the name of three popes, as follows:

Lucius I.: d. March 254. He succeeded Pope Cornelius on 23 June and by some authorities is said to have suffered martyrdom under Gallus, but this cannot be proved.

Lucius II. (GHERARDO CACCIANEMICI, gā-rär'dō kä"chē-ä-nä-mē'chē): d. 15 Feb. 1145. He was legate to Germany from Honorius II., supported Innocent II. against the antipope, Anacletus II., and became chancellor of the Holy See. In 1144 he succeeded Celestine II., but was unsuccessful in quelling revolts against the papal authority in Rome and while heading his troops to suppress a disturbance, was killed by a paving stone thrown from the mob.

Lucius III. (UBALDO ALLUCINGOLI, oo-bäl'-dō äl-loo-chēn'gō-lē): d. Verona 25 Nov. 1185. He was the cardinal-bishop of Ostia and became pope 1 Sept. 1181. He was the first pope elected solely by the cardinals. The emperor Frederick Barbarossa having claimed the estates bequeathed to the papacy by Matilda of Tuscany, Lucius demanded their surrender. Frederick refused and the quarrel ended in the expulsion of Lucius from Rome. He died an exile in Verona.

Luck of Edenhall, The. See EDENHALL.

Luck of Roaring Camp, The, a celebrated short story of California mining life written by F. Bret Harte (q.v.), which was first published in the 'Overland Monthly' in 1869. The story attracted attention in the East and appeared in book form the following year. It is perhaps the most notable of the many short stories of Western life written by this author.

Luck'now, India, the capital of Oudh, 580 miles northwest of Calcutta, on both banks of the Gumti, here spanned by two native and two British built bridges. The city is connected by the Oudh and Rohlkund line with the general Indian railway system. Lucknow has an imposing appearance at a distance which a nearer view fails to realize. The principal buildings are: the Kaiserbagh palace, built in 1850, now occupied as government offices and forming a gorgeous pile of domes, pinnacles, terraces and fountains; the Imâmbara or holy palace, where Asuf ud Douelah is buried, now an arsenal; the great mosque or Jama Masjid; and the Hoseinalad or small Imâmbara with the mausoleum of Mohammed Ali. The Martinière College for half-caste children is a striking building founded by Claude Martin, a French soldier who became a general in the East India Company; other educational institutions include Canning College and several English schools, libraries and mission churches. Lucknow was one of the chief seats of the Indian Mutiny (q.v.) and the residency, the Secunder Bagh, and the Alumbagh where Havelock is buried are reminiscences of the siege. Pop. (1901) 264,049. Consult: Innes, 'Lucknow and Oudh in the Mutiny' (1895).

Luckock, Herbert Mortimer, English clergyman: b. Great Barr, Staffordshire, 11 July 1833. He was graduated from Jesus College, Cambridge, was twice vicar of All Saints, Cambridge, and was rector of Gayhurst and Stoke Goldington. Subsequently he was residentiary canon of Ely and principal of the Ely Theological College, and in 1892 became dean of Lichfield. Among his writings are: 'Tables of Stone'; 'The Intermediate State'; 'Footprints of the Apostles'; and 'Old and New Testament Sermons.'

Lucretia, lū-krē'shĭ-ạ, Roman matron of distinguished virtue, whose ill-treatment by Sextus Tarquin led to the destruction of the kingdom, and the formation of the republic of Rome. She was the wife of Collatinus, a near relation of Tarquin, king of Rome. Sextus Tarquinius, who contrived to become a guest in the absence of her husband, whose kinsman he was, found means to reach her chamber in the middle of the night, and threatened, unless she gratified his desires, to stab her, kill a slave, place him by her side, and then swear that he had slain them both in the act of adultery. The fear of infamy succeeded. She afterward summoned her husband, father, and kindred, and after acquainting them with the affair stabbed herself to the heart. The story has been variously adapted by poets and romancers.

Lucretius, lū-krē'shĭ-ŭs, **Carus Titus,** Ro
man author: b. probably 97 B.C.; d. 53 B.
About his life almost nothing is known. He
supposed to have studied Epicurean philosop
at Athens. He is said to have been made insa
by a philtre, in his lucid intervals to have p
duced several works, and to have committed s
cide in his 44th year. We possess of his com
sition a didactic poem, in six books, the '
Rerum Natura,' in which he exhibits the co
cal principles of the Epicurean philosophy
an original imagination, and in forcible langu
The work is in six books, revised by Cicero,
is entire but, evidently, not complete.
theory of corpuscles and their properties;
origin of the vital and intellectual principle
the senses; of the world and the movem
the heavenly bodies; of the rise and progr
society; and of arts and sciences, with
expositions of natural phenomena, are s
sively treated. Lucretius' purpose was t
his readers from the fear of death which
lieved to be bound up with the supersti
the popular religion. As a work of art hi
has received the unanimous praise of cri
the skill with which the most unyieldin
rials are reduced to a poetic diction ful
and sustained majesty. It has influen
foremost English poets. (See Tennyso
'Lucretius'). The principal editions a
of Lachmann (3d edition, Berlin, 18
Munro, with an English translation
revised edition by Duff, 1886). The
also been translated into English b
Busby, and Good.

Lucullus, lū-kŭl'ŭs, **Lucius Lici**
man soldier of the 1st century B.C.
young man he served with distinct
Marsic war, and accompanied Sulla
into Asia on the breaking out of the
war, 88 B.C. He expelled Mithri
Chios and Colophon and defeated hi
dos. After peace had been concluded
ridates he remained in Asia till 80 B.
was elected curule ædile, an office w
in conjunction with his younger br
sequently he held the office of præ
conclusion of this magistracy he we
the administration of which prov
ducted with ability and impartiali
B.C. obtained the consulship with
Cotta. As consul he maintained th
al laws of Sulla. On the breaki
war with Mithridates he obtained
ship of Cilicia and the command
He vanquished the squadron of M
the island of Lemnos, and this

him to drive all the other squadrons of Mithridates from the Archipelago. The generals of Lucullus subdued meanwhile all Bithynia and Paphlagonia. Lucullus, again at the head of his army, although overcome by Mithridates in a battle, soon acquired such advantages that he finally broke up the hostile army, and Mithridates himself sought protection in Armenia. Lucullus now changed Pontus into a Roman province. Tigranes, king of Armenia, refusing to surrender Mithridates to the Romans, Lucullus marched against Armenia and vanquished Tigranes 69–8 B.C. Mithridates, however, contended with varying fortune, till Lucullus was prevented from effectively continuing the war by the mutiny of his soldiers. Lucullus was deprived of the chief command, which was bestowed first on Glabrio, and afterward on Pompey, and recalled 66 B.C. After a delay of three years he succeeded in procuring the merited recognition of his services in a public triumph. He laid out his gardens at Rome with such splendor that they became proverbial, and Pompey called him the Roman Xerxes.

Lucy, Henry W., English journalist: b. Crosby, near Liverpool, 5 Dec. 1845. He was for a time a member of the Shrewsbury *Chronicle* staff; in 1870–3 was connected with the *Pall Mall Gazette* (morning edition); and from 1873 with the *Daily News*, of which — with the exception of the period January 1886–July 1887, when he was editor-in-chief — he was the parliamentary correspondent. He visited the United States in 1883, on his way around the world; an account of which journey appeared in the New York *Tribune* in the form of letters, subsequently collected as ‹East by West› (1885). On the death of Tom Taylor (q.v.) Lucy continued the former's ‹Essence of Parliament› in *Punch* as ‹The Diary of Toby, M. P.› Among his books are ‹Men and Manners in Parliament› (1874); ‹A Diary of Two Parliaments› (1885–6), and ‹Gladstone› (1896).

Lucy, Sir Thomas, English landed proprietor: b. 1532; d. Charlecote 7 July 1600. He was educated by John Foxe (q.v.), the famous martyrologist; and he followed the Puritan sentiments of his tutor. In 1552 he came into possession of great estates in Warwickshire, in 1558–9 rebuilt the manor-house, which still exists, an excellent specimen of the Tudor style. He was knighted in 1565, and elected M. P. for Warwick in 1571 and 1584. His chief interest is in his alleged connection with Shakespeare (q.v.) whom he is said, in a story dating from the 17th century, to have prosecuted for deer-stealing. This story is now thought to be based on fact, though burdened with false details; and Shakespeare is believed undoubtedly to satirize him as Justice Shallow in ‹The Merry Wives of Windsor.›

Lud'dites, in British history, a name given to rioters in 1811–16, in Yorkshire, Lancashire, and Nottinghamshire, in England, who attributed the prevailing distress to the introduction of machinery in manufactures, and did a great deal of damage in destroying it. For a time these counties were in a perpetual state of disturbance, but on the return of prosperity the riots ceased.

Lud'ington, Mich., city, county-seat of Mason County; on Lake Michigan and Marquette River. It is the terminus of the Pere Marquette railroad; about 85 miles northeast of Milwaukee, Wis., 130 miles northwest of Lansing, the capital of Michigan, and 61 miles from Manitowoc on the opposite side of the lake. It has regular steamer communication with the large ports on Lake Michigan, and direct freight connection, by ferry, with Manitowoc, Wis. It was settled in 1851, incorporated in 1867, and chartered as a city in 1874. The principal industries are connected with the manufacture and shipment of lumber. There are large lumber mills, game-board factories, furniture and clothes-pin factories. Lumber, grain, flour, salt, and fruit are among the articles shipped to outside markets. The city has many guests in the summer months, attracted by the cool climate and opportunities for fishing in the several lakes nearby. The Epworth League Training Assembly has nearby grounds and cottages. Pop. (1900) 7,166.

Charles T. Sawyer.

Ludlow, lŭd'lō, **Edmund**, English leader of the Republican party in the civil wars of Charles I.: b. Maiden Bradley, Wiltshire, about 1617; d. Vevay, Switzerland, 1692. He was graduated from Trinity College, Oxford, in 1636; fought at Edgehill in 1642; in 1646 was elected to Parliament from Wiltshire; and in December 1648 was one of the chief promoters of ‹Pride's purge› (q.v.). He was one of the judges who signed the death-warrant of Charles I., sat in the council of state in 1649-50, and was lieutenant-general of the horse in Ireland and a commissioner for the civil government of that country in 1650–5. In 1656, upon the proclamation of Cromwell as lord protector, he declined to recognize Cromwell's authority, or to give security to keep the peace. Having been allowed to go into retirement in Essex, he was elected to Parliament for Hindon in 1659, and upon the recall of the Long Parliament became a member of the committee of safety (7 May), of the council of state (14 May), and commander-in-chief of the Irish army, with rank of lieutenant-general (4 July). He was impeached upon the Restoration (1660), surrendered, was allowed his liberty on providing sureties, and escaped to Switzerland. His ‹Memoirs› (1698–9) furnish a good account of the opposition to Cromwell and of the factional troubles which overthrew the republic.

Ludlow, Fitzhugh, American journalist: b. Poughkeepsie, N. Y., 11 Sept. 1836; d. Geneva, Switzerland, 12 Sept. 1870. He was graduated from Union College in 1856, in 1858–9 studied law in New York, in 1859 was admitted to the bar, but from 1860 devoted himself exclusively to literature. In 1860–1 he was connected with the *World* and the *Commercial Advertiser*, for a time was dramatic, art and musical critic of the Evening *Post*, to which he long contributed, and held a similar post as critic on the ‹Home Journal.› In 1863 he journeyed across the plains to Oregon and California, and in an article styled ‹Through Tickets to San Francisco,› laid out a route for a Pacific railroad largely identical with that later followed. He was among the earliest contributors to ‹Northern Lights› of Boston, upon the establishment of that magazine. Among his works are: ‹The Hasheesh Eater: Being Passages from the Life of a Pythagorean› (1857); ‹Little Brother and Other Genre Pictures› (1867); ‹The Opium Habit› (1868); and

Heart of the Continent: A Record of
’ (1870).

dlow, James Meeker, American Presby-
clergyman and author; b. Elizabeth, N.
March 1841. He was graduated from
ton in 1861, from the Princeton Theolog-
minary in 1864, entered the Presbyterian
y and was pastor of the First Presbyterian
of Albany 1864–8, and of the Collegiate
ned Church of New York in 1868–77. His
ent pastorates were that of Westminster
, Brooklyn, N. Y., (1877–85) and that of
st Presbyterian Church of East Orange,
(from 1886). In 1885 he declined the
ncy of Marietta College (Ohio). His
are: ‘My Saint John’ (1883); ‘Concen-
art of History’ (1885); ‘The Captain of
nizaries’ (1886); ‘A King of Tyre’
; ‘That Angelic Woman’ (1893); ‘His-
f the Crusades’ (1896); and ‘Baritone’s
’ (1897).

dlow, John Malcolm, English author:
ach, India, 8 March 1821. He was edu-
t the College Bourbon, Paris, became a
er of Lincoln’s Inn, London, in 1843, and
ed as a conveyancer till 1874. He was
registrar of Friendly Societies, 1874–91,
as published ‘Letters on the Criminal
(1847); ‘The Master Engineers and
Workmen’ (1852); ‘British India: Its
and Its History’ (1852); ‘Thoughts on the
of the Crown Toward India’ (1859);
h of the History of the United States from
ndence to Secession’ (1862); ‘President
Self-Portrayed’ (1866); ‘The War of
can Independence’ (1876); etc.

dlow, Roger, American colonial states-
). Dorchester, England, 7 March 1590; d.
ia about 1665. He was by profession a
, came to Boston in 1630, was there assist-
the general court of Massachusetts in
in 1634 became deputy governor, but was
d for the post of governor, removed with
sachusetts colony to Windsor, Conn., and
is thought, the first practising lawyer in
cticut. In 1639 he was a member of the
tion for preparing a constitution, and the
ent is believed to have been drafted by
In Connecticut also he was made deputy
or, and here, too, John Haynes, who had
d him for the governorship in Massachu-
vas again victorious in the gubernatorial
. In chagrin Ludlow sought to evade his
enius,” as he styled Haynes, by founding
vn of Fairfield. Here he held each public
of any importance, was a commissioner to
w England congress, and revised the laws
necticut (1672). The Manhado Indians
threatened Fairfield, the citizens declared
ainst the Dutch, at whose instigation the
s were believed to be acting; and Ludlow
ade captain of the forces. The New
general court, however, quashed this pro-
g, and punished Ludlow’s subordinate of-
Ludlow then (1654) withdrew in high
on with all the town records to Virginia,
he quite disappeared.

dlow, William, American soldier: b.
Long Island, N. Y., 27 Nov. 1843; d. Con-
N. J., 30 Aug. 1901. He was graduated
West Point in 1864, entered the engineer
, was chief engineer of the 20th corps in
eorgia campaign (July–September, 1864),
in 1864–5 was engineer of the army
was assistant engineer on Sherman’s
«March to the Sea» and in the Ca
13 March 1865 was brevetted lieute
U. S. A., for meritorious conduct i
linas campaign. After various serv
chief engineer of the department o
1872–6, engineer in charge of the Del
and harbor improvements and defens
by authority of Congress chief engi
Philadelphia water department in
was at different times in charge o
districts and engineering work. In
came president of the Nicaragua ca
sion and 13 August was promoted lie
onel of engineers in command of th
depot. Commissioned brigadier-gen
unteers 4 May 1898, he became engi
of the American army in the field i
ish-American war, served in the Sa
paign, was made major-general of
Sept. 1898, and from 13 Dec. 1898 t
was military governor of Havana, in
itation of which city he took an im
On 13 April 1899, he became briga
of United States volunteers, and on
brigadier-general United States army
dent of the board of officers appoi
consideration of the establishment
war college, he visited France an
for purposes of study. In 1901 he
to the Philippines as commander of
ment of Visayas, but immediately
sick-leave. He wrote: ‘Explorati
Black Hills and Yellowstone Cou
‘Report of the United States Nicara
Commission.’

Ludwig Salvator von Toscan
säl-vä’tōr fōn tōs-kä’nä, Archduke
Austrian traveler: b. Florence 4 Aug.
was the son of Leopold II., Grand Duke
cany. His principal writings, all illust
himself and most of them published anon
are: ‘Levkosia, Capital of Cyprus’
‘Yacht Voyage to the Syrtes’ (1874);
geles in Southern California’ (2d ed
‘The Caravan Route from Egypt
(1878); ‘The Balearic Islands,’ super
trated (7 vols., 1869–91); ‘Around
without Intending It’ (4th ed. 1886
and Antiparos’ (1887); ‘The Lipar
(1893).

Lufft, Hans, hänts looft, Germ
and publisher: b. 1495; d. 1584. He
first complete edition of Luther’s Bib
tenberg, in 1534. He also printed
of Luther, and more than 100,000 c
Bible were issued from his press.
Family.

Lugano, loo-gä’nō, Switzerlan
the canton of Ticino, on the north s
of Lugano; about 15 miles northw
Como. Its principal edifices are sev
one, Santa Maria degli Angioli, con
of the «Passion,» by Bernardino L
a hospital, and a theatre. The ma
chiefly spun silk and silk goods.
trade is considerable. Till 1881
nately with Locarno and Bellinzo
the legislature of the canton of
10,000.

Lugano, Lake of (Latin, *Ce*
is partly in the Swiss canton Ti

in Italy; between Lakes Como and Maggiore, into the latter of which it discharges its waters. It is of very irregular shape, a narrow body which throws out arms in all directions. Its length is about 20 miles, its breadth about one and one-half, and its depth about 300 feet. Its scenery is very wild and beautiful.

Lug'ger, the former name for a small vessel not unlike the schooner of the present day; having two or more lug-sails, that is fore-and-aft sails set on one yard hung obliquely to the mast at one-third its length.

Lug'worn, or **Lobworm,** a marine annelid (*Arenicola piscatorum*), dwelling in burrows on sandy beaches of the European coast, and in Great Britain much used as bait by anglers.

Luini, Bernardino, bĕr-năr-dē'nō loo-ē'nē, Italian painter: b. Luino, on the Lago Maggiore, between 1475 and 1480; d. soon after 1533. He was perhaps the most distinguished representative of the Milanese school, and between 1500 and 1533 was active as a fresco and easel painter in Milan and other places of northern Italy. He began his studies as the pupil of Ambrogio Vorgognone, whose influence is plainly seen in his ‹Pietà› in the church of Santa Maria della Passione at Milan, though the blandness and delicacy of the early Milanese school is in his work somewhat animated and vitalized by the spirit he derived from the study of Leonardo da Vinci, under whose name some of his riper work has frequently gone. But though his frescoes are full of spiritual faces, and distinguished by the tenderest coloring, and the most lifelike movement, he never quite made his own the grandeur in composition and passionate energy which distinguish the paintings of Leonardo. Most of his productions are found in Upper Italy. Many of his easel pictures are to be seen in the Ambrosiana (library), Brera (palace), and in private galleries at Milan; others in the cathedral at Legnano. In the Uffizi at Florence is his ‹Beheading of John Baptist.› His chief work is ‹The Enthroned Madonna with Saint Anthony and Saint Barbara› (1521), a magnificent fresco in the Brera. Other examples of this painter are now in the Palazzo Sciarra at Rome, as well as in the Louvre, the National Gallery of London, and the Berlin Museum.

Luise, loo-ē'zė, **Auguste Wilhelmine Amalie,** queen of Prussia: b. Hanover 10 March 1776; d. Strelitz 19 July 1810. She lost her mother in her 6th year and was brought up in charge of her grandmother at Darmstadt. In her 17th year she was married to the crown prince, afterward Frederick William III., of Prussia. On her husband's accession to the throne she won all hearts by her beauty, gracefulness, and kindness of disposition. Her highest happiness was found in her husband and children, but she was also a queen who has left a deep impression on the annals of the Prussian court. In her travels with the king through the provinces she was constantly engaged in helping the poor and unhappy. When the war of 1806 broke out she accompanied her husband to Raumburg and, after the disaster of Jena, to Königsberg and Memel, setting an example to all by her unbroken fortitude. Before Tilsit she hoped to win from Napoleon more favorable conditions for her beloved country, and interceded with the conqueror in vain. She is a household name to this day in Prussia, and the Order of Luise was founded in her honor by her husband, the king, 3 Aug. 1814. It is the object of this order to honor patriotic and benevolent women of the Prussian nation. The badge is a gold cross enameled in black. In the centre is a shield of blue on which the letter L is enclosed in a circle of stars. The ribbon is white, striped with black. Consult: Hudson, ‹Life and Times of Louisa, Queen of Prussia› (1874); and Adami, ‹Luise, Königin von Preussen› (1888).

Luke, Saint, author of the third gospel, and the Acts of the Apostles. His place and date of birth are equally unknown, but it is certain from Col. iv. 11 as compared with 14, that he was a Gentile. Eusebius calls him a native of Antioch, but there is no authentic evidence of this. He was a physician, and his works show him to have been an educated man, with a literary style distinctive and often pregnant and picturesque. He possessed a wide acquaintance with eastern Mediterranean places, their customs, forms of worship, and typical characteristics. Tradition asserts that he was a painter, but this may be merely a fanciful tribute to the manner in which he groups and sets off the incidents of his Gospel with an almost pictorial coloring and a symmetry which show true artistic sense of proportion. According to the Acts of the Apostles he appears as the companion of St. Paul from Troas to Philippi, and some have supposed that his services as a physician were needed by St. Paul, whose frequent sicknesses are alluded to in his epistles. He probably remained at Philippi, the key to Europe in the Apostolic programme, from 52 to 58, and rejoining St. Paul there was his companion till the narrative of his journeys comes to an end. He was most likely in Palestine during St. Paul's imprisonment at Cæsarea (58–63), and then made his researches into the Gospel history (Luke i. 1–4). As he was not an eye witness of Christ's life, he cannot have been one of the seventy, as Epiphanius of Salamis supposes. Of his life after the death of St. Paul absolutely nothing is recorded. We know from the epistles of St. Paul that he was with that apostle during the latter's imprisonment in the Mamertine prison at Rome, from which his leader went forth to martyrdom. In art he is represented with an ox lying near him, and this beast of sacrifice is sometimes called his emblem; or as painting the portrait of the Virgin, or surrounded by the implements of the painter, or robed like a learned physician. According to some records he preached in Bithynia, and St. Jerome says he lived to the age of 84. See GOSPELS; ACTS OF THE APOSTLES.

Luke, Gospel of. See GOSPELS.

Luke of Leyden (LUCAS VAN LEYDEN, properly LUCAS JACOBSZ), one of the founders of the Dutch school of painting: b. Leyden, 1494; d. there 1533. In earlier life he was taught painting by his father, Huig Jacobsz, and afterward by Cornelius Engelbrechten. At 9 he began to engrave, and in his 12th year astonished all judges by a painting, in water-colors, of St. Hubert. In his 15th year he produced several pieces, composed and engraved by himself, among which the ‹Temptation of St. Anthony,› and the ‹Conversion of St. Paul,› in regard to composition, characteristic expression, drapery, and management of the graver, are models. After this he executed many paintings in oil, water-colors, and on glass; likewise a multitude of engravings, which spread his fame widely. He formed a friendly intimacy with the celebrated John of Mabuse and Albert Dürer, who visited him in Leyden. His overwork at last resulted in hypochondria and he imagined himself poisoned by envious painters, and hardly left his bed for the last six years of his life. The fullest and most beautiful collection of engravings by this master is in the library at Vienna. His paintings are scattered through the galleries of London, Berlin, Rome, as well as in Holland, where is his masterpiece, 'Mount Calvary,' a composition containing some 80 figures.

Lully, lŭl'ĭ, **Lull,** or **Lul, Raimon** (Doctor Illuminatus), Spanish scholastic: b. Palma, Majorca, 1235; d. at sea in sight of Palma 1315. After having been attached to the court of James I. of Aragon, he retired to a cell on his estate, where he lived as an ascetic. Encouraged by visions, he came to believe himself appointed to refute Mohammed and convert the Moslems to Christianity, and studied Latin, Arabic, and logic in preparation for this work. His 'Ars Demonstrativa Veritatis' was devised as an infallible and universal logical method to be used in making conversions, for the purpose of proving that the mysteries of faith were not contrary to reason. Lully believed that his method was destined to supplant the scholastic logic of the Middle Ages. His history now becomes a record of ceaseless travel. He endeavored without success to obtain aid from Pope Nicholas in establishing colleges for the study of Oriental languages. The Ars Lulliana consists mainly in categorizing ideas and combining them mechanically, by which means Lully thought to exhaust their possible combinations. The method was taught and commented on in some schools of little influence in Spain, France, and Italy, but it is hardly necessary to say that it never took root or produced any direct effects. Lully's works are very numerous. A collected edition is that begun by Galizinger (1521–42); Vols. VII. and VIII. never published). Consult: Erdmann, 'Grundriss der Geschichte der Philosophie' (2d ed. 1869).

Lumba'go (from Latin *lumbus,* loin), a painful affection of the muscles and tendinous attachments of the lumbar region. See Rheumatism.

Lumber Industry in the United States, The. The history of the lumber industry of the United States began at the landing of the first colonists in Massachusetts, Virginia and Georgia. Loghouses sheltered the early settlers. Planks were split from logs and dressed by axes. At length pit sawing, a hand operation, became the initiative of the great saw-mill industry. As population increased and the demand for building material developed the inventive genius and energy of the people evolved the saw mill, which was run by water power. Subsequently came the steam mill. In the progress of events the evolution, starting from the old sash and muley mill, with a capacity of 6,000 to 10,000 feet a day, has attained to the modern one of 100,000 and even 350,000 feet capacity, in some notable instances. During the 283 years since the Pilgrims landed at Plymouth Rock the lumb
dustry of the United States and Canad
grown to a production of probably 1,000,00
000 feet, board measure. In but three St
Michigan, Wisconsin and Minnesota — a
ing to best available statistics, the product
pine lumber from 1830 to 1897 amounted t
000,000,000 feet, to which can be added 7
000,000 of hard woods, making a grand to
363,000,000,000 feet, the valuation of whic
been computed at $5,250,000,000.

The early development of lumber ma
ture of course occurred in that narrow fri
Atlantic coast country first settled by emi
from Europe. They found the entire c
heavily wooded. White pine abounded
New England States and pitch pine in Vi
the Carolinas and Georgia. The most s
dous growth of the lumber industry has in
white or soft pine, since it abounded from
westward to beyond the Mississippi,
States wherein the most rapid growth o
lation, settlement of new territory, the
tion of internal improvements, and deve
of transportation facilities have occur
the early history of the country the peop
white pine for structural purposes becau
abundance and availability. Other woo
used, but the main supply of lumber wa
from pine. In New England and th
States, however, the industry was larg
the lumber produced being mainly devo
erection of farm and village structu
immediate vicinity of the mills, all of w
small. As such cities as Boston, New
the lesser ones grew up along the coas
for a large product was developed.
also a demand for ship-building, an
for shipment to the West Indies and
eign parts. The coast trade began t
supplied from Maine, which came t
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that the white pine lumber industr
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of pine were yearly cut and floate
Champlain and the Sorel river i
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About the time this pine was
that of Maine and New Hampsh
ning to approach exhaustion the
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the white pine industry of Mich
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a divine purpose in planting th
forests contiguous to the Grea
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and Minnesota rose to its ma
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earliest statistical record was m
the total amounted to 3,993,7
totals did not materially vary
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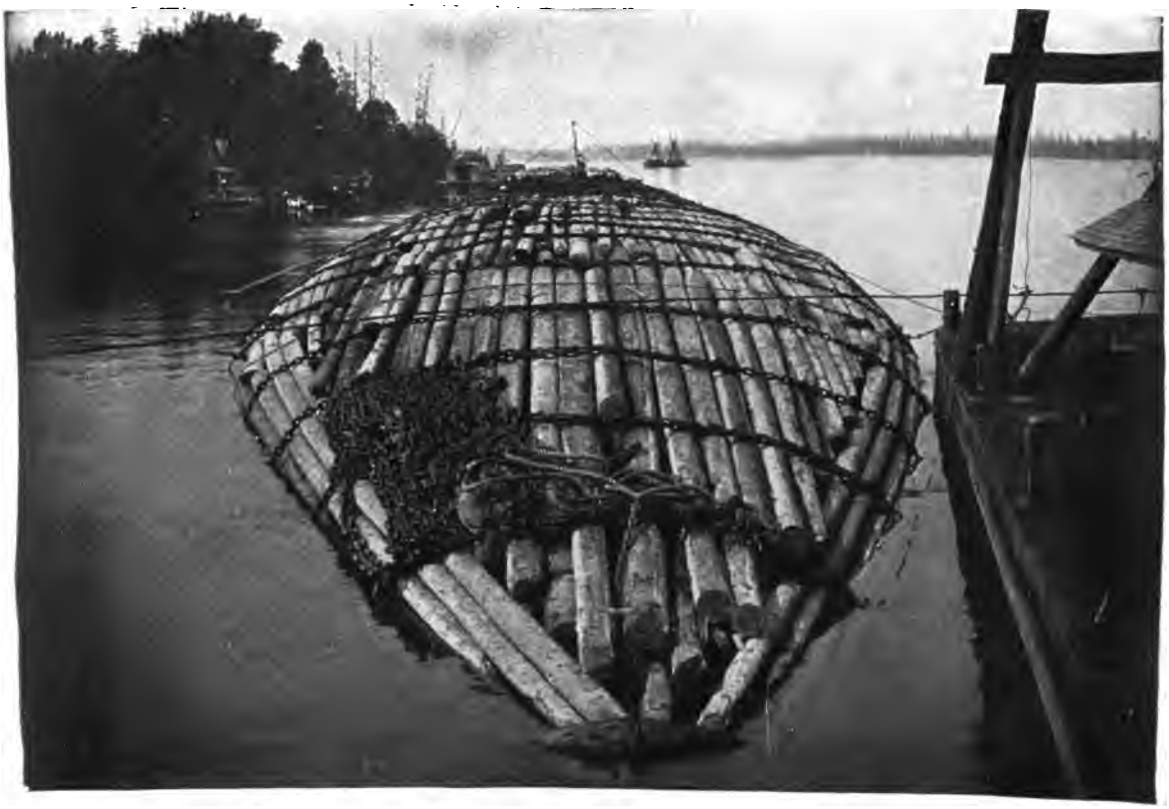
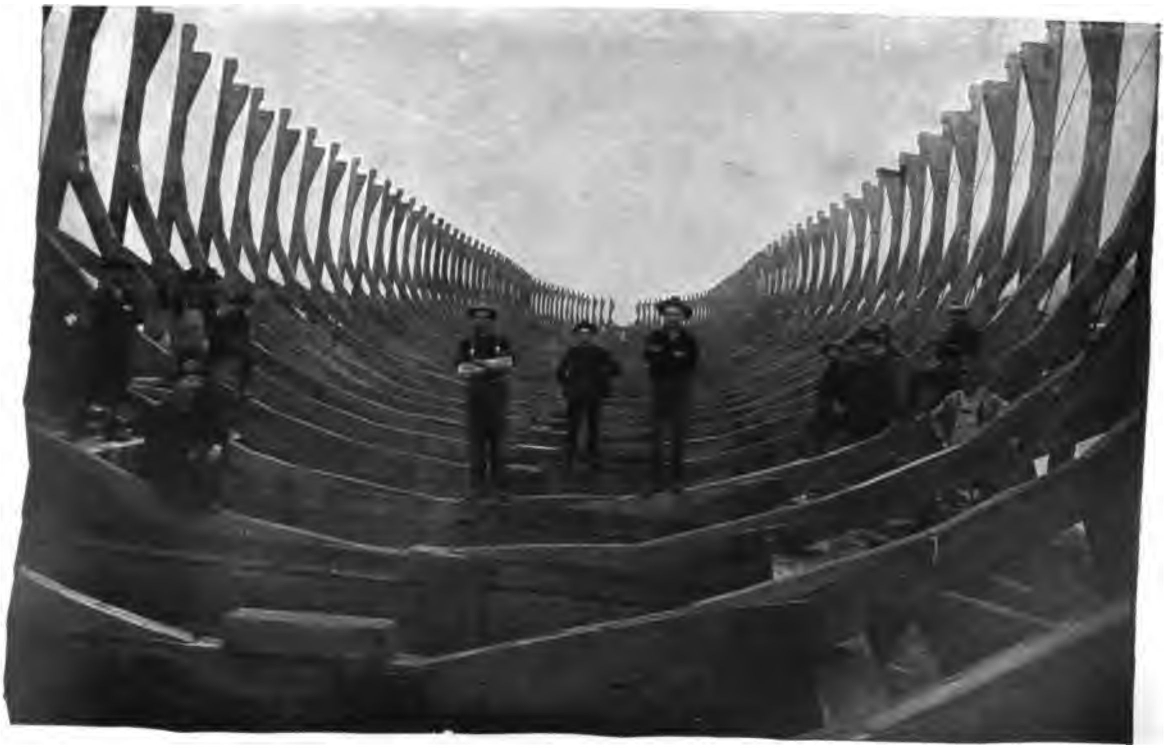


A GIANT RAFT ON THE COLUMBIA RIVER, BOUND FOR SAN FRANCISCO.



THE EMPTY "CRADLE" FOR BUILDING A GREAT RAFT.

ON THE COLUMBIA RIVER, NEAR ASTORIA.

was reached in 1890. A positive decline in total product was noticeable in 1894, and it was gradual, with some fluctuations, until 1902, when the total had dropped to 5,294,395,000 feet, figures which still represent an enormous amount of lumber. The development of the prairie States, the rapid increase in population and wealth, the building of thousands of miles of railroad and the magical growth of cities, including Chicago, all caused a demand for lumber of a rapidly swelling volume unprecedented in the history of the world. Hence we have a forest product swelling in two decades nearly 300 per cent and reaching a value in one year of at least $85,976,230.

The declension of the annual product of white pine and its consort, Norway pine, has been marked since 1896, and never again in one year can the production reach the total of 1890, or even of the later one in 1895, when the output was 7,050,669,235 feet. The pine supply of the lower peninsula of Michigan is verging toward exhaustion, that of the once prolific Menominee district in upper Michigan and Wisconsin is long past its zenith, the Wolf river district in Wisconsin turns out but a few million feet of logs annually, while the same is true of the Black River and other streams in that State. More than four fifths of the total product of the three States is now turned out from the western two thirds of Wisconsin and Minnesota. This territory produced 4,328,930,000 feet of a total for the three States named of 5,294,395,000 feet. The diminishment of the white and Norway pine supply of the North would have been an unmitigable calamity if compensation had not resulted from the growth within recent years of the yellow pine product of the South. This began to be manifest in the lumber trade of the Middle West early in the '80s of the last century. But before this, and beginning with the early settlement of the Atlantic coast colonies, the pitch pine of Virgina, North Carolina, South Carolina, Georgia and Florida held a relation in respect to consumption like white pine in the North. It entered into the local supply for building material, and as the cities grew and coastwise and foreign commerce increased, the pine of the southern coast was used for building of houses and ships, and was sent to foreign lands. In time the product of the mills was shipped by sea to New York, Baltimore, Philadelphia, Boston and other ports. For many years the flooring manufactured from Georgia pine has been a favorite in the northeastern States. The export of pitch pine, or yellow pine, timber from the southern coast has built up such important shipping points as Pensacola, Mobile, Fernandina, Jacksonville, Savannah, Wilmington and Norfolk. Yet it remained for a later time to develop a vast interior demand for the yellow pine of Georgia, Alabama, Mississippi, Louisiana, Arkansas and Texas. The promotion of this growth arose from the decline in the supply of northern pine already referred to, which was seen to be imminent early in 1900. Ten years before that efforts had been made in Mississippi, Arkansas and Texas to push yellow pine as a competitor in middle western markets, with varying success. More rapid progress was made from 1890 forward and still greater from 1901 to 1903. Lumbermen and capital from the old pine States of the North were attracted to the southern field, many new and modern mills were built, and railways were constructed for hauling logs from the forests to the mills. In the meantime the total northern pine supply in the three main producing States had declined from 8,597,623,000 feet in 1890 to 5,294,395,000 in 1902. This gave yellow pine opportunity to pass into the vacuum caused by the shrinkage of northern product. The longleaf pine of the gulf section, from Georgia to Texas, was admirably adapted to conversion into bridge, railroad and building timber, car sills and other parts of car building, as well as to flooring and interior finish. The shortleaf pine, while not so much in request for the heavier forms of construction, was much sought after for the lighter frames of buildings and all interior and exterior work. It was peculiarly adapted to enter into a various manufacture, especially of doors, sash, interior trim, etc. The remarkable development of Kansas, Nebraska, Indian Territory, Texas and Oklahoma has given an impetus to yellow pine manufacture and distribution in the southwest. At the same time Mexico has increasingly drawn upon the supply, and the South American, West Indian, South African and European demand is an important feature of the trade in localities convenient to Gulf and Atlantic ports. As the northern pine supply diminishes, the main lumber resource of the country east of the Missouri River will be the yellow pine of the South. Included in the whole will be the longleaf, shortleaf, loblolly, Cuban and North Carolina varieties. The United States census estimates from obtainable data that the yellow pine forests of the South cover approximately 150,000 square miles, or 100,000,000 acres. The average stand per acre is estimated at 3,000 feet, board measure, thus giving a total of 300,000,000,000 feet. The cut in the census year 1900 was made out to be 8,523,000,000 feet, or 3 per cent of the estimated stand. If the estimate of the total stand is approximately correct there was enough in 1900 to supply the annual cut, at the rate in that year, for 33 years, without allowing anything for growth in the interval.

Another factor within recent years has been thrust into the lumber supply of the United States; this is lumber from the Pacific coast States, with an appreciable quantity from Idaho, Montana, Arizona, New Mexico, Colorado and Wyoming. The prominent features of this far western supply are the fir, cedar, spruce and hemlock of Washington and Oregon, and the redwood, sugar and white pine of California. Fir and redwood are the leaders in Pacific coast lumber resources. Before the building of the transcontinental railways the consumptive demand of the Pacific States and the export trade were the only outlets for mill product. For many years after the Union Pacific, the Southern Pacific and the Northern Pacific railroads were opened to traffic west coast lumber made but little progress in the East. In the eighth decade of the last century attempts were made to introduce California redwood of high grade for interior finish and some special cabinet purposes, but high freight rates precluded much use of such lumber. Small amounts reached the Atlantic coast cities by sea. At about the same period, though somewhat later in the decade, fir timber from Washington was sent into the Middle West to be used where especially long and large pieces were required for special work. From these initiatives the trade in redwood and fir made slow and irregular progress until about 1900, when the declining supply of white pine and advancing prices therefor turned the attention of manufacturers of doors and sash to the consumption of California sugar pine and white pine in their industry. Idaho pine was also exploited in the same connection. Redwood also began to receive more attention in the country east of the Rocky Mountains. Increased energy was given to the pushing of Pacific Coast lumber of all sorts in the eastern and middle portions of the country by the capital and enterprise of lumbermen of the old pine States who had begun to operate in the newer fields on the Pacific coast.

The three Pacific coast States, Washington, Oregon and California, contain an estimated one-third of the standing timber of the country — about 660,000,000,000 feet for the three. The timber found in the greatest abundance in these States is fir, red, yellow and white, the last named forming a very small percentage of the whole. Red cedar is found in Washington and Oregon and white cedar in Oregon and California. The various species of the pine are found in eastern Washington, southern Oregon and northern and central California. The fir forests are intermixed with spruce, hemlock and cedar. The growth of the lumber industry on the Pacific coast has been very rapid during the last few years, due to the expansion of trade in the far eastern countries, the opening of the Philippines and a wider distribution abroad. The home consumption has increased steadily and has been a potent factor in the development. Shipments to eastern States have assumed larger proportions and will continue to grow as the forest resources of the older lumber-producing States become exhausted. Fir, which is used for almost every purpose where lumber is desired, and which makes a large percentage of the entire output, comprised nearly two thirds of the output in 1902, according to the statistics compiled by the 'American Lumberman,' the total being 2,238,962,000 of a grand total of 3,932,364,000 feet, which included the product of Nevada, Idaho and Montana. The remaining product was about evenly divided between spruce, cedar, redwood, sugar pine, white or yellow pine and other soft woods. About the same ratio held good in 1901. None of the Pacific coast States is a heavy producer when the standing timber is taken into consideration with that in the East. Washington, which has an outlet to the East by three railroads, is far in the lead. It also has unexcelled facilities for handling the export trade and the best natural harbors of the world. Oregon practically has only two lines of railroad and only two good harbors, so that the industry in that State has not kept pace with the growth in Washington, although Oregon has more timber than any other State in the Union. In making up the figures for the Pacific Coast, Idaho, Montana and Nevada were included. The report, which was very comprehensive although not entirely complete gave an output of fir of 2,238,962,000 feet in 1902; in 1901, when the report was not so comprehensive, the total was 1,424,097,000; spruce — 1902, 242,082,000; 1901, 149,499,000; cedar — 234,529,000 in 1902, 138,882,000 in 1901; redwood — 317,568,000 in 1902, 119,476,000 in 1901; sugar pine — 150,914,000 in 1902, 132,653,000 in 1901; other pine — 716,622,000 in 1902, 448.367.000 in 1901; other soft woods — 89,516,000 in 1902, 73,8
woods — 3,330,000 in 190
shingles — 6,297,916,000 i
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been increasing very fast and it would seem as though it was getting ahead of the demand or that it was growing faster than the markets. This is especially true of the cedar shingle industry, in which the great increase in the production caused values to depreciate in 1903.

The most plebeian of all American lumber woods is hemlock. It is a coarse-grained wood, much given to unsound knots and shape. Its growth is scattered from the north Atlantic coast to Minnesota; it is mostly found among the hardwood growths of the uplands, but sometimes standing in groups and groves on the lower levels bordering swamps. Hemlock is a cheap kind of lumber. It has been used from the earliest days of the republic by the farmers and villagers of the northern tier of States, Pennsylvania and West Virginia, for the building of houses and barns. Within a few years it has been exploited in the lumber trade of Michigan and Wisconsin as a supplement to the diminishing supplies of white and Norway pine. It is distributed in the Middle States and the northerly belt of the Middle Western States, being largely used for framing dimension, and coarse boards, shingles and lath. The total output of hemlock lumber for the United States in 1899 was 3,420,673,000 feet.

Spruce from an early period has furnished the northeastern States a large aggregate of structural and manufacturing material. It is a coniferous wood, grows with a lofty, smooth body, of moderate diameter. It abounds in Maine, New Hampshire, Vermont, northern New York in large commercial quantity, and stands in considerable amount in upper Michigan, northern Wisconsin, northern Minnesota, also in the Appalachian range in the South. Industrially and commercially considered, spruce has occupied an important position in the lumber trade of the East. Maine has been the most prolific source of supply. Though spruce holdings in that State have been much reduced within recent years the annual cut is still considerable. The Adirondack region of northern New York is next to Maine in magnitude of spruce production. Spruce furnishes a large part of framing dimension used in Boston, New York, and other coast cities, and the districts contiguous to those centres. Spruce also enters into other forms of building material and also factory product. It is highly esteemed for siding of clapboards throughout New England. Spruce is also the main dependence in the manufacture of paper pulp, and a great industry has been developed in getting out pulp wood. In the old pine states of the Northwest the rather limited growth of spruce is being utilized for lumber and pulp wood. Pacific coast spruce is elsewhere treated of in this article.

White cedar, another conifer, is prevalent in all the New England and Middle States, and those touching the Great Lakes. It is used for railroad ties, telegraph and telephone poles and fence posts. Shingles also are comprised in white cedar products. The annual output is large, but no statistics of it have ever been gathered.

Cypress is a tree growth of the damper alluvial bottoms of the South and the Ohio River Valley. It makes a sizable growth and turns out a large percentage of clear lumber. The wood is comparatively soft and easily worked, and as a shop lumber and one adapted to interior building purposes, as well as for siding, porch work and shingles, is taking the place of white pine. The same can also be said in reference to tank making, and it is much devoted to car building. The strongest present factor in the cypress trade is the red cypress produced in Louisiana. The most copious supply comes from the mills of that State and enters into the lumber trade of the Middle West, the Southwest and the East. Cypress is also in vogue among consumers in all the Gulf coast cities. A large amount of cypress is produced in the Carolinas and Florida, Georgia, Alabama, Mississippi and Arkansas.

The hardwoods of the United States in the early history of the country were much less prized than the coniferous timbers, especially the pines. This was because in the settlement of the country the soft woods were more available than the hard for structural purposes. They were abundant, were easily cut and handled and were light enough to float in the streams and lakes, then the only means of transportation. The live oak of the south Atlantic coast and the white oak of the North were from an early date used for ship-building and any purpose where great strength and durability were requisites. Oak, cherry, maple and birch were also employed for the making of furniture. In the latter use, however, mahogany entered into the making of furniture for the rich throughout the earlier and middle portions of our history. When the railroad era came in, the great interior of the northern States was opened up, population expanded and numerically increased, and the utility of and demand for the hardwoods began to be developed. Western New York, Ohio, Indiana, Michigan, southern Illinois and the valleys of the southern rivers abounded with abundant growths of fine oak of several varieties, ash, black walnut, yellow poplar, hickory, sycamore, gum and other useful woods. New England, New York, Michigan, northern Wisconsin and northern Minnesota were included in the zone where maple, beech, elm, birch, black and white ash and other available woods abounded.

Commercially considered, the great leader among American hardwoods is oak in its several varieties; paramount among the varieties is white oak. In trade and the industries white oak ranks relatively with white pine, and for cabinet purposes is a near approach to mahogany. No other wood enters into so wide a range of uses as white oak. It is employed as timber and planking in ships, in the construction of canal locks, bridges, railroads, cars, vehicles of all kinds, agricultural machinery, tools, cooperage etc., outside of interior finish and furniture manufacture. In respect to the last two named uses white oak has taken first place in the common application, though red oak is largely employed. In the very finest finish and furniture mahogany only ranks above white oak. The growth of the hardwood lumber trade was accelerated after railroads began to penetrate the western States, beginning with about 1845, the mileage extending rapidly after 1850. For many years thereafter the oak and ash supply was largely drawn from the States north of the Ohio River, but considerably from Kentucky and Tennessee. Along in 1880 hardwood lumbermen began to invade the rich hardwood regions of the lower Mississippi and tributaries, lying along the river bottoms in Missouri, Arkansas, Mississippi and Louisiana. The hardwood industry of these States has in latter time grown to immense proportions, though the output of oak in either Indiana or Ohio up to 1900 continued to exceed that of any of the Southern States.

The total production of oak in 1900 was 4,438,027,000 feet, the total valuation having been $61,174,120 on a basis of $13.78 a thousand. During the past 25 years there has been a remarkable increase in the use of both white and red oak in finishing the interior of buildings and the making of furniture. In the earlier history of the country, pine was mostly employed in the interior work of all but first rate structures throughout the country from the eastern seaboard westward. But in the recent period of rapid accumulation of wealth and the growth of artistic and luxurious tastes, soft woods for interiors have largely been discarded, and oak has been substituted as the most available for medium class structures, and to a large extent the better class when mahogany and other tropical woods were not utilized. This copious use of oak has promoted a great industry and a trade which is not only domestic in prevalence but extends to Europe and other foreign countries. Quarter sawing is a special feature in the treatment of both white and red oak, that kind of manufacture being especially chosen for the finer finish and furniture. Red oak has long been the favorite in both plain and quarter-sawed treatment among home finishers and furniture manufacturers, because of its softness and easiness of working and its bright and conspicuous figure when plain sawed lumber is finished. Next to oak, ash leads in the manufacture of agricultural machines and implements, boat oars and various other manufactures. White ash is the strongest variety, but black ash is largely used in cooperage, bent work, some cabinet work and house finish. The available quantity of ash of both varieties is rapidly diminishing.

As late as 1880 to 1884 black walnut was the most conspicuous furniture wood in the United States, and also much employed for interior finish. It not only was a favorite in this country but in Europe as well. Its most abundant supply was in the States of the Ohio River watershed, Indiana probably leading in the total production. It is a regal wood, though it has passed to the rear in demand, partly because of its diminishing supply and partly because the public taste at length revolted at its sombre hue. Yet walnut stands preeminent as a cabinet wood in some particulars. There are its softness under the operation of tools, its satiny appearance when finished, its durability under hard treatment, and its dignity as compared to other woods either in furniture or finish. Though the supply of black walnut has so far diminished as to place it among the minor kinds of American lumber, it is still present in considerable quantity. Indiana, Ohio, Missouri, Tennessee, Iowa and Kentucky still furnish the market with walnut, the total from the last census having been 38,636,000 feet. Of this total Indiana is credited with 10,637,000 feet, Ohio coming next with 6,857,000 feet and Missouri third with 6,285,000 feet. The larger portion of the black walnut now produced is shipped to foreign countries, Germany and France probably being the larger purchasers.

Maple, elm of the soft and hard varieties, birch, cherry, chestnut, sycamore and beech are all used for furniture making, for house trim, and various other things. At one time cherry
was an important furniture wood, but the supply
is so nearly exhausted that it commands less
attention than formerly. Chestnut is much devoted to coffin making, and sycamore is em-
ployed when a rarity in figure is wanted i
interior finish or furniture. Both are mino
woods in the trade. Hickory has always bee
a favorite in the construction of vehicles,
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available quantity is never in excess of
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Basswood is classed among the hardwo
commercially speaking, because it is a dec
ous growth. Its texture is, however, so
than that of some of the coniferous wo
Basswood abounds in the northern forests,
to a degree in the South, but its most na
habitat is in the maple and beech zone.
has entered largely into the lumber ind
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used to some extent in exterior and in
building, and is highly prized in all work
a white, easily worked and sometimes
wood is required. The forest growth is
rapidly exhausted in Michigan and Wis
which States have harbored the most ab
tracts within recent years.

Among the hardwoods gum, or satin
as it is called in Europe, has recentl
in importance. It abounds in the O
lower Mississippi valleys and wherev
bottoms are found all over the South.
hard, compact wood of involved grai
of large growth, comparatively free
and is being made adaptable to vari
The two main varieties are red gum a
The red variety, so called from the
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tors and consumers. A few years ago
a rejected kind of lumber, because th
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mand within recent years has so inc
manufacturers have been urged to
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result that gum is now successfully
has become an important factor
Since there is a vast growth of gum
river bottoms a great enlargement
is inevitable.

Cottonwood in recent years has
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facture, wagon box boards, backi
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As an all-purpose wood popla
adaptable as any that is converte
Reference is here made to the
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and southern Michigan. The
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sawing and bent work. It is much used for carriage bodies, coffins, wagon boxes, furniture, stained finish, packing boxes, porch columns, agricultural machines, billiard tables, siding and casings for houses, door and sash making, and a multitude of applications that cannot be mentioned here. In fact there is little wood work to which poplar cannot be made to apply. For this reason the domestic and foreign demand for poplar has always readily absorbed the supply, but it is constantly brought into sharp competition with other woods. See Forestry in the United States; Wood-working Machinery.

J. E. Defebaugh,
Editor of the 'American Lumberman.'

Lumber State, a popular designation for the State of Maine; because of the large forests and the great number of its people engaged in lumbering.

Luminais, Evariste Vital, ĕv-ā-rēst vē-tāl lü-mē-nā, French painter: b. Nantes 14 Dec. 1822. He studied with Léon Cogniet and Troyon, received a third-class medal at the Paris exposition of 1855, and one of the first class at that of 1889. His works are largely genre and historical studies from Gallic legends and early French annals, and his manner is spacious and full of vigor.

Luminif'erous Ether. See Ether.

Lum'inous Paint, a paint containing phosphorus, which after exposure to strong light becomes luminous in the dark for a time. It is used for street signs, buoys, clock dials, etc. See also Paint; Phosphorescence.

Lum'mis, Charles Fletcher, American author: b. Lynn, Mass., 1 March 1859. He was graduated from Harvard in 1881, went to Los Angeles, Cal., there was an editor of the *Daily Times* (1885–7), and later became editor of the monthly 'Out West.' He spent five years among the Pueblo Indians of New Mexico, studying their speech and customs. Among his writings are: 'A Tramp across the Continent' (1892); 'The Land of Poco Tiempo' (1893); 'The King of the Broncos' (1897); 'The Enchanted Burro' (1897); 'The Awakening of a Nation' (1898), and the collection, 'The Man who Married the Moon, and other Pueblo Indian Folk-Stories' (1894).

Lump'kin, John Henry, American jurist: b. Oglethorpe County, Ga., 13 June 1812; d. Rome, Ga., 6 June 1860. He studied at Franklin College of the University of Georgia and at Yale; after a course in law was admitted to the bar in March 1834, entered practice at Rome, Floyd County, Ga., was a member of the Georgia house of representatives in 1835, and was solicitor-general of the Cherokee circuit in 1839–42. As a Democrat he sat in the United States Congress in 1843–9 and 1855–7; and in 1849–52 he was judge of the Cherokee circuit court. In 1857 he was Democratic candidate for governor of Georgia, but was defeated. In 1860 he was a delegate to the State Democratic convention (June) and to the Democratic national convention held at Charleston, S. C., and Richmond, Va. (23 April; 21 June).

Lumpkin, Joseph Henry, American jurist: b. Oglethorpe County Ga., 23 Dec. 1799; d. Athens, Ga., 4 June 1867. He was a brother of Wilson Lumpkin (q.v.). He was graduated from the College of New Jersey (now Princeton) in 1819, studied law in the office of Judge Cobb at Athens, was admitted to practice in October 1820, and practised at Lexington, Ga., until 1844. In 1824 and 1825 he represented Oglethorpe County in the State legislature of Georgia, and from 1845 was chief justice of the Georgia supreme court. He was one of the chief organizers of the Lumpkin law school of the University of Georgia, and occupied the chair of law in the school in 1859–61. He resumed the professorship in 1865, and retained it until his death. In 1833 he assisted in the compilation of the penal code of Georgia. Both as an advocate in criminal cases and as a judge he is described as exceedingly able. For many years he was prominent in the temperance movement.

Lumpkin, Samuel, American jurist: b. near Lexington, Oglethorpe County, Ga., 12 Dec. 1848; d. Washington, Wilkes County, Ga., 18 July 1903. He was graduated from the University of Georgia in 1866, was admitted to the bar in 1868, was solicitor-general of the northern Georgia circuit in 1872–6, and State senator in 1878–80. In 1885–90 he was judge of the superior court of the northern circuit, on 1 Jan. 1891 became associate justice of the supreme court of Georgia, and on 4 Jan. 1897 presiding justice of the 2d division of that court.

Lumpkin, Wilson, American politician: b. Pittsylvania County, Va., 14 Jan. 1783; d. Athens, Ga., 28 Dec. 1870. He was a brother of Joseph Henry Lumpkin (q.v.). He removed to Oglethorpe County, Ga., in 1784; in 1797 was made a copyist in the superior court of Oglethorpe County; was admitted to the bar; and practised at Athens, Ga. He was elected several times to the lower house of the Georgia legislature, and also served in the State senate. In Congress he sat as a representative from Georgia in 1815–7 and 1827–31. In 1831–5 he was governor of Georgia (two terms). During his administration the Cherokees were deported across the Chattahoochee, and the region previously occupied by them was subdivided into thirteen counties, the county and town (in Stewart County) of Lumpkin being named in his honor. From 13 Dec. 1837 to 3 March 1841 he was United States senator to fill a vacancy. In 1823 he was appointed by President Monroe to determine and map the boundary line between Georgia and Florida; and he was also a member of the first State board of public works, appointed by the legislature. As State surveyor he laid out most of the lines of early Georgia railways.

Lumpkin, Tony, in Goldsmith's comedy 'She Stoops to Conquer,' a rude country squire, the son of Mrs. Hardcastle by her first marriage. He is ignorant and boisterous, and clownishly conceited, and the humor of his practical joking bears the stamp of his innate viciousness.

Lump'sucker, an extraordinary marine fish (*Cyclopterus lumpus*), of oval, ugly form and allied to the sea-snails (*Liparis*) and gobies. It is remarkable for the brilliant red and purple colors which the male puts on in the breeding season in the spring, when it approaches rocky shores on both sides of the northern Atlantic to deposit its spawn. This fish has the short ventral fins so united as to form a sucking disk by which it attaches itself to the bottom and holds on against waves and currents, while it preys upon small fishes, crustaceans, etc. It is well known and eaten in Scotland under the name «cockpaidle.»

Lumpy Jaw. See Actinomycosis.

Luna, Antonio, än-tō'nē-ō loo'nä, Filipino insurgent politician: b. Manila, Philippine Islands, about 1854; d. Luzon Island, Philippines, 8 June 1899. He was educated largely in Paris, returned from Europe to Manila early in 1898, and became the editor of ‹La Independencia,› organ of the insurgent party. Upon the formation of a so-called government by Emilio Aguinaldo in December 1898, the latter placed Luna at the head of the war department. Shortly afterward Luna was removed from this post and made the immediate commander of Aguinaldo's forces with general's rank. Difficulties arose between himself and Aguinaldo; and the latter, fearing, it was said, an attack upon his life by Luna, ordered the guards to kill anyone regardless of rank who might attempt to enter the headquarters. Upon Luna's appearance and demand for an interview, he was accordingly shot.

Luna, Pedro de, pä'drō dā, antipope: b. Spain 1334; d. Peñiscola, Valencia, 1424. He was sprung from a noble family of Aragon, and, after entering the priesthood, became distinguished as a canonist, and was appointed professor in the university of Montpellier. He received a cardinal's hat in 1375 and was elected to Avignon as antipope in 1394. The conclave of cardinals annexed as a condition to his election, that he should resign if ever an opportunity occurred when, by so doing, he could put a stop to the schism. This he refused to do although he was deposed by the council of Pisa (1409), and by that of Constance (1417). Banished from Avignon, he retired to the fortress of Peñiscola, near Valencia; where he spent the rest of his life in excommunication.

Luna, lū'na (the moon), among the Greeks *Selēnē.* Her worship is said to have been introduced among the Romans in the time of Romulus. She had a temple on the Aventine, one on the Capitol, a third on the Palatine.

Luna Moth, one of the largest and most beautiful of the great American silkworm moths, *Tropœa luna.* Its general color is delicate green, there is a purple brown band along the front edge of the fore wings, and a pair of richly colored ocelli upon each of both pairs of wings, the hinder pair of which terminate in long curving «tails.» The caterpillar grows to a length of about three inches, and is pale bluish green with a pearl-colored head; it has a pale yellow stripe along each side of the body, and a transverse yellow line on the back between each two abdominal segments. It feeds upon leaves of forest trees, as the hickory, walnut, etc. The cocoon is formed of a very thin, leaf-like material with little silk, and is usually found upon the ground.

Lu'nacy, Lunatic, etc. See Insanity.

Lunalilo, loo-nä-lē'lō, **William C.,** king of the Hawaiian Islands (1873–4): b. 1835; d. 3 Feb. 1874. He received a good education, and was liberal in his political views. His health failed soon after his ascending the throne, and he paid inadequate attention to administrative business.

Lu'nar Caustic. See Nitrate of Silver.

Lunar Tables, in astronomy, ponderous volumes of solid figures which are the numerical development and tabulation of the analytical theory of the moon's motions and perturbations. See Moon.

Lunar Theory, The, in astronomy, the deduction of the moon's motion from the law of gravitation. See Moon.

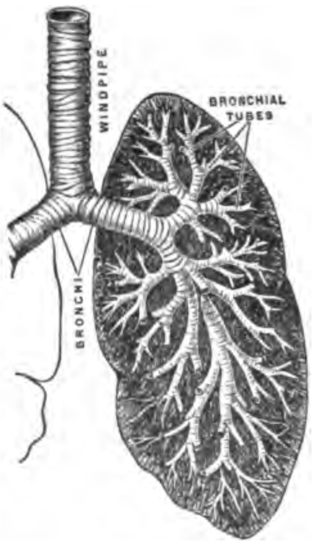
Lunar Year. See Year.

Lund, loond, **Peter William,** Danish naturalist: b. Copenhagen, Denmark, 14 June 1801; d. Lagôa Santa, Minas Geraes, Brazil, 5 May 1880. He traveled in Brazil 1827–30 and was sent there on a Russian scientific expedition in 1831. Three years later he established himself at Lagôa Santa, where he passed the rest of his life in exploring the limestone caves of the region and studying the fossils contained in them, discovering several hundred species in the course of his investigations.

Lund, Sweden, town, in the lān of Malmöhus, on an extensive plain, about eight miles from the Sound and 24 miles east of Copenhagen. It is a very ancient place, and was once surrounded with wooden fortifications, and had its warehouses filled with the merchandise and treasures. In the Middle Ages the Scandinavian monarchs were elected kings of Scania on a hill in the immediate vicinity. The present town occupies a large extent of space, and is very irregularly built. It has an ancient Romanesque cathedral, one of the finest churches in Sweden (recently restored); a university attended by 700 students, and occupying buildings erected in 1878–82, while the old building contains the library (180,000 volumes), historical museum, etc. With the university are connected a zoological museum and a botanic garden. The town boasts of a statue of Tegnér, and the house in which he lived. Glovemaking and iron-founding are among the industries, and there is a trade in agricultural produce. Pop. (1901) 16,621.

Lun'dy, Benjamin, American abolitionist: b. Hardwick, Sussex County, N. J., 4 Jan. 1789; d. Lowell, La Salle County, Ill., 22 Aug. 1839. His parents were members of the Society of Friends. At 19 he removed to Wheeling, Va., where he labored as an apprentice to a saddler. At this place his attention was first directed to the subject of slavery. He subsequently settled in business in St. Clairsville, Va., where in 1815 he originated an anti-slavery association, called the «Union Humane Society.» Soon after a journal entitled «The Philanthropist» was commenced at Mount Pleasant, Ohio, to which Lundy contributed. He then visited St. Louis, where he remained nearly two years engaged in a newspaper exposition of the slavery question. At Mount Pleasant, he commenced, in 1821, the publication of the ‹Genius of Universal Emancipation,› the office of which was removed to Baltimore in 1824. In 1825 he visited Hayti to make arrangements for the settlement of emancipated slaves. In 1828 he visited the eastern States, where he formed the acquaintance of a number of prominent abolitionists, one of whom, William Lloyd Garrison, afterward became associated with him in editing his journal. In 1830–1 he traveled in Canada and Texas to obtain subscribers to his paper, and to continue his observations on the condition of the slaves. He continued his literary connection with the

line of the body, in front of the last cervical and the first five or six dorsal vertebræ. In the back part of the trachea there are transversal muscular fibres of the unstriped variety. The fibrous tissue found in the trachea belongs to the two varieties of yellow elastic and white fibres. The mucous membrane is thin and in perfect continuity with that of the larynx and that of the bronchi. Its most remarkable feature is that its epithelial covering is composed of ciliated cells having in high degree the vibratile movement. All along the trachea there are many mucous glands, and these are especially numerous upon its back part. The cilia lash upward, and thus keep the passages free from mucus and remove foreign particles. As the passages become smaller they lose their cartilages, and the muscles form a continuous circular layer. The length of the trachea is from four to five inches. The average transversal diameter of this tube is between nine and twelve lines in adults. The anterior two thirds of the trachea is cylindrical, the posterior third is a flattened wall. In the neck the trachea is covered by the skin and a few flat muscles; in the chest it is placed between the two lungs and covered by muscles, lymphatic glands, and the bony and cutaneous walls of the thorax. The structure of the trachea is complicated. This tube is essentially composed of an internal layer which is a mucous membrane and an external one which is fibrous. Imbedded in these membranes are from 16 to 20 cartilaginous pieces, with the shape of a horseshoe, or of a ring one third of which is missing. These incomplete rings are placed transversely at nearly equal distances one from the other; they give to the anterior two thirds of the trachea the cylindrical form.



The essential parts of the lungs are the air-cells or air-sacs, in which the function of respiration is performed. They consist of somewhat elongated cavities, which communicate with a bronchial ramification by a circular opening, usually smaller than the cavity of the cell. The air-cells are arranged in groups and separated from each other by thin walls. Many small, shallow, cup-like depressions, separated from each other by portions of membrane, are found at the bottom and on the lateral walls of the air-sacs. These, the alveoli, have no communication with each other except by their opening in the cavity of the air-sac. An epithelial layer exists in the air-cells and the alveoli. The walls of the air-cells are formed of a thin membrane in which the blood and lymph-capillaries ramify. Minute openings lead from the air-cells into the lymph-spaces of the membrane. The membranous walls are partly formed of elastic tissue. It is this that gives to the lungs their elasticity. At the root of the lungs the membrane known as the visceral pleura is continuous with a membrane which lines the chest-cavity (the parietal pleura). The space between the two is the pleural cavity; it is in reality a large lymph-space, and communicates with the lymphatics of the pleura. Owing to the air-pressure within the lungs, the two pleuræ are closely pressed together, the lungs entirely filling the chest-cavity.

The lungs are united with the heart and with the trachea by a part called the root, which, in each side, is composed of the large bronchus, a branch of the pulmonary artery, two pulmonary veins, and smaller vessels and nerves, the whole being almost completely covered by the pleura. Each lung is divided into lobes, two in number in the left one and three in the other. Each lobe is divided into lobules, which are arranged on the bronchial tubes like grapes on a bunch. Each lobule is surrounded by condensed areolar tissue mixed up with yellow elastic tissue. Each lobule is a fair representation, on a small scale, of a whole lung, as it hangs upon a bronchial tube, a branch of the pulmonary artery, branches of bronchial vessels, and nerves. In the roots of the lungs the two large bronchi divide, the right into three, and the left into two bronchial tubes, one for each of the pulmonary lobes. The primary bronchial tubes are very short, and divide into two or three smaller tubes, each of which gives off two or three divisions. Before reaching their termination, the tubes branch off four or five times more.

The weight of the lungs varies much according to age and sex. In adult men the two lungs weigh from 40 to 50 ounces, and in women from 28 to 35 ounces. The ratio of the weight of the lungs to that of the body is as 1 to 30 or 40. The specific gravity of the lungs is very slight, and, unless the air has been expelled from the cavities of the bronchial tubes and of the alveoli, any part of the lungs dipped into water will rise and float.

As respiratory organs the lungs bear a certain average relation to the physical proportions and condition of the individual. The average amount of air in the case of an individual 5 feet 8 inches in height that goes in and out of the lungs at each inspiration and expiration is about 20 cubic inches; this is called the tidal air. By means of forced inspiratory movements the ingoing tide may be increased by 120 cubic inches; by means of a forced expiration the outgoing tidal air may be increased by 90 cubic inches. After the most forced expiration possible there always remain within the lungs about 90 cubic inches of air. So that if a person takes as deep a breath as possible, and then makes as forced an expiration as he can, he will the alveoli undergoes softening and liquefaction, and is either expectorated or carried away by the lymphatics.

The symptoms of a typical case begin abruptly with a severe chill, and a sharp stabbing pain in the side, followed by a quick rise of temperature to 104° or 105° F. The breathing is rapid, varying from 40 to 60 or over, with an expiratory grunt, and a dry, restrained, and painful cough. The face is flushed, there is often a circumscribed redness on the cheek of the affected side, and the nostrils dilate with each inspiration. A thick, tenacious, rusty, or blood-stained expectoration appears. The pulse is rapid (100 to 120) and bounding. The tongue is coated, the bowels constipated, the urine scanty, high-colored, often slightly albuminous, and as a rule strikingly deficient in chlorides. The lips are often bluish and present herpetic eruptions (cold-sores). Delirium is frequently manifest. In the majority of cases there is an increased number of white cells in the blood (leucocytosis), the count ranging from 12,000 to 50,000. The fever, having risen to its highest point (as a rule within 24 hours), remains high, with remissions, for from 5 to 10 days, when typically it falls (by crisis) within a few hours (5 to 12) to or below the normal.

With reference to the physical signs: Compensatory increase of the movement of the unaffected side may be observed, and the vocal fremitus over the affected portion of the lung is increased, unless the bronchial tubes are filled with a thick secretion. There is marked dulness over the solidified lung areas. The percussion-note over the healthy parts of the lung, especially over those portions lying above an area of consolidation, may be hyper-resonant, or even tympanitic. In the early stages the breath-sounds may be weak, and the crepitant râle is often audible at the end of inspiration. As consolidation occurs, the breath-sounds become broncho-vesicular and finally intensely bronchial. The spoken and whispered voice-sounds are conveyed with great distinctness. During the second stage no râles may be heard, but friction sounds are often present. In the third stage (resolution) small moist crepitations (*râle redux*) become audible.

Death may take place at any time during the disease. It is a very fatal malady in drunkards, and in persons of 60 years or over (60 to 80 per cent); so also in infants under one year. As a rule, above one year, the younger the patient the better the outlook for recovery. The most common cause of a fatal result is the toxæmia (blood-poisoning) due to the causative germ, and the heart-weakness arising therefrom. Meningitis as a complication is always lethal. Unfavorable symptoms are the supervention of the "typhoid status," very high fever (105° F. or over), marked cyanosis, severe dyspnœa, rapid extension of the disease to other lobes or to the opposite lung, and increasing weakness of the heart with pulmonary œdema.

In some instances of recovery the consolidation may persist for from eight to ten weeks (delayed resolution), during which there is fever of a remittent type. In rare cases lobar pneumonia may terminate in abscess, gangrene, or chronic fibrosis. Recurrences are frequent; third or fourth attacks are common, and eight to ten have been reported. Relapses are rare.

Like other infections due to specific microorganisms, lobar pneumonia may present striking variations both in symptoms and character. Thus the fever may be slight or entirely absent in old persons and chronic alcoholics. The crisis may be as early as the third day. The fever may terminate by lysis (gradual fall) instead of by crisis(sudden fall), especially in children. There may be a false (pseudo) crisis two or three days previous to the final fall. Not infrequently cough and expectoration are slight or absent in the very old, the very young, in topers, and in those previously ill with serious acute or chronic maladies. The sputum may be of a red, rusty, yellow, or dark-brown ("prune-juice") color. Very seldom there is spitting of blood early in the disease. Pain is absent in deep-seated pneumonias when the pleura is not involved. In children the pain is usually referred to the abdomen; and abdominal pain, often severe, and generally due to involvement of the diaphragmatic pleura, is not uncommon in adults. Tympanites (excessive amount of gas in intestines) is by no means rare. The pulse may be dicrotic in severe cases, or small and rapid, or full but soft and followed by serious weakness of the heart. The character of the pulse is no indication of the manner in which the right ventricle is standing the strain of pulmonary obstruction. A more reliable criterion is the pulmonary second sound, which, if accentuated, shows that the lesser circulation is being maintained. A persistent absence of leucocytosis is, except in mild cases, a symptom of bad omen. Convulsions often initiate the disease in children, and in them the symptoms may closely resemble those of meningitis. Deafness not depending upon inflammation of the middle ear is not infrequent. The delirium of lobar pneumonia may be active or maniacal, especially in drunkards.

The variations in the character of the disease depend partly upon the site and extent of the local lesions, but mainly upon differences in the resisting power of the patient and the virulence of the pneumococcus. Among the atypical cases are those occurring in old persons. In them the disease is often latent, there is no chill, and but slight cough or expectoration. The general prostration is marked, while the physical signs are indefinite or obscure. In infants and young children the disease frequently begins at the apex (top) of the lungs, the temperature is high, and convulsions, delirium, stupor, and coma are often prominent symptoms. Not infrequently vomiting and diarrhœa are so severe and persistent that the pneumonia may be overlooked. Typhoid pneumonia is characterized by muttering delirium, dry brown tongue, teeth covered with sordes, twitching of the tendons (*subsultus tendinum*), and perhaps picking at the bed-clothes or grasping at imagined objects in the air (*carphologia*)—symptoms resembling those which may appear in a severe attack of typhoid fever. In drunkards the disease may begin gradually, the fever may not be high, the delirium is commonly of the violent type, and the typhoid status often develops, ending in death by exhaustion. The localization of pneumonia is variable. Most frequently the right lower lobe is attacked, and in double pneumonia both lower lobes are usually involved. When the consolidation steadily advances from lobe to be discovered. Sodium salicylate and carbonate of creosote, the latter especially, have given apparent good results. One or two initial doses of quinine, say seven or eight grains of the sulphate, are highly recommended. An initial dose of calomel does good service. Side-pain is to be relieved, preferably by mustard, poultices, or the ice-bag; if necessary by the smallest efficient doses of morphine or Dover's powder. The use of oxygen is desirable except in the milder cases. Delirium and restlessness may need the use of trional, veronal, bromides, chloral, camphor, hyoscine hydrobromate, or morphine. For very high fever frictions with cold water are desirable. The cold tub may or may not be advisable, but its use is as a rule not to be commended. For weakness of the heart — the main channel through which life runs away in this disease — strychnine, caffeine, ammonia, and wine or spirits are most useful. In addition may be required digitalis, nitroglycerine, sparteine, strophanthus, camphor, and musk.

Broncho-pneumonia.— This (called also capillary bronchitis, lobular pneumonia, catarrhal pneumonia) is an inflammation of the terminal bronchi and their communicating air-cells, due to the presence of two or more varieties of micro-organisms. Those most commonly found are the *Pneumococcus lanceolatus, Streptococcus pyogenes, Staphylococcus aureus et albus,* and the germs of diphtheria and influenza (la grippe). The disease may come suddenly during good health, or may be secondary to some pre-existent disease. It attacks especially the very young (under five), the very old, or the debilitated of any age. It is most common among those who live in unsanitary surroundings. The primary cases are usually due to cold and exposure. The secondary cases follow acute bronchitis, measles, whooping-cough, diphtheria, scarlet fever, erysipelas, and smallpox. It may succeed the inhalation of food or drink while the patient is unconscious; or operations on the mouth or nose; or any accident or disease which permits germ-containing particles to enter the bronchial tubes.

The pathology of the disease involves the presence of small areas of consolidation around the bronchioles, and small patches of collapsed lung (which can be inflated) due to occlusion of the bronchi. The terminal bronchioles and the air-cells are filled with an exudate composed of leucocytes and degenerating epithelium. The bronchial walls also contain numbers of leucocytes. In the majority of instances both lungs are involved.

The symptoms, if the disease is primary, begin abruptly, with a chill and a rapid rise of temperature, thus resembling lobar pneumonia. If there is a pre-existing bronchitis of the larger tubes the onset is less abrupt and there is rarely a distinct chill. The characteristic symptoms are cough, dyspnœa, rapid respiration (40 to 80) with an expiratory moan, rapid pulse, and perhaps cyanosis. As the disease affects both lungs, the physical signs are bilateral. There are numerous sibilant and sonorous râles, at first and perhaps all through the disease, without evidences of consolidation. If areas of consolidation sufficiently numerous and confluent exist, there will be slight or even decided dulness, broncho-vesicular or bronchial respiration, and increased vocal fremitus and bronchophony. These signs are commonly found at the bases posteriorly and on either side of the spine.

The type of the disease varies. In certain cases (suffocative catarrh) the dyspnœa and cyanosis steadily increase, the cough lessens, the respirations become rapid and shallow, and the râles larger and moister. The patient is drowsy, but restless, and death ensues from weakness and overdistention of the right ventricle. The fever in some instances, especially in children, may be of a remittent type and lead to a mistaken diagnosis of malaria. The primary form in infants and young children sets in abruptly with chill and high fever, and bears a close resemblance to lobar pneumonia; in adults it may begin like a severe acute bronchitis, but the fever, cough, and dyspnœa are more marked than in a bronchitis, and the sputum is tenacious and rusty. The secondary form begins as a bronchitis, often of slow development, with increase in the fever of the primary disease (for example, measles), cough, dyspnœa, and rapid breathing.

The duration is variable. Cases of great severity, especially in children, may prove fatal in from three to six days; the common type ending in recovery endures from one to three weeks; exceptionally the disease may be protracted to six or eight weeks, rarely even to ten or twelve weeks. Death may occur at any time. The fever declines by lysis.

In the diagnosis of the disease the cardinal symptoms are fever, cough, dyspnœa, rapid respiration, and bilateral physical signs. Its differential diagnosis from lobar pneumonia has been stated in the description of the latter disease. From the broncho-pneumonic form of pulmonary tuberculosis the distinction may be extremely difficult. A tuberculous family history, progressive emaciation, the finding of tubercle bacilli in the sputum, and the occurrence of the signs of softening, will declare for tuberculosis.

With regard to the prognosis, it is to be remembered that broncho-pneumonia is always a grave disease. The primary cases usually recover; the fatality is greatest in the secondary forms. In children among the well-to-do the mortality varies from 10 to 30 per cent; in hospitals, and among the very poor, from 30 to 50 per cent. Inhalation broncho-pneumonia is usually fatal because of its frequent termination in abscess or gangrene.

Concerning treatment, the utmost importance should be attached to prophylaxis, for instance, the prevention of the spread of an ordinary bronchitis of the larger tubes to the terminal bronchi, especially in children. Perhaps the most important measure of prevention is to keep the patient in an even temperature of 68° to 70° F., and to avoid all depressing agencies, as overfatigue, improper food, etc. The disease, having declared itself, requires in the main the same management as a lobar pneumonia. Opiates, however, should rarely be employed. Local counter-irritation of the chest, poultices, wet compresses, and frictions with stimulating liniments, constitute a much more important element of the treatment than in lobar pneumonia; so also perhaps do the so-called expectorants, such as the ammonium preparations. If the child is unable to expel accumulated mucus the use of an emetic (ipecac, alum) may be desirable.

Lung'wort. The name of several plants supposed to have medicinal value in respect to diseases of the lungs. One is a lichen (*Sticta pulmonacea*) growing on the trunks of trees in moist sub-alpine countries. In Siberia it is used as a substitute for hops. Another such a plant is a genus of borages (*Pulmonaria*). The narrow-leaved lungwort is *P. angustifolia*, and the common lungwort, *P. officinalis;* the former is wild. These are European; but an American borage, the blue-blossomed Virginia cow-slip (*Mertensia virginica*) is called tree-lungwort in the Southern States, and used by compounders of simples. A near relative is the sea-lungwort (*Pneumaria maritima*). Another is one of the hawkweeds (*Hieracium pulmonarium*), called French or golden lungwort in Canada. Bullock's or cow's lungwort is the great mullein (*Verbascum thapsus*).

Lunn Hemp. See FIBRE.

Lunt, George, American journalist and poet: b. Newburyport, Mass., 31 Dec. 1803; d. Boston, Mass., 17 May 1885. He was graduated from Harvard in 1824, studied law and was admitted to the Essex bar in 1827. He sat in the State legislature, was appointed United States District Attorney by President Tyler and during the Civil War was associate editor with George S. Hillard (q.v.) of the Boston *Courier*. He published 'Poems' (1839); 'The Age of Gold' (1843); 'The Dove and the Eagle' (1851); 'Lyric Poems' (1854); 'The Union,' a poem (1860); 'Origin of the Late War' (1866); 'Old New England Traits' (1873).

Lupercalia, lū-pėr-kā'lĭ-ạ, an ancient Roman festival celebrated annually in honor of Lupercus, an ancient pastoral god of the Italians, afterward identified with the Arcadian Pan, who protected the flocks against wolves and gave them fertility. The festival dates from the earliest period of the history of Rome; it was held on the Lupercal, where Romulus and Remus were supposed to have been nurtured by a she-wolf. The day of celebration was 15 February, which was originally the last month of the Roman year.

Lu'pine, a genus of annual and perennial herbs and a few shrubs (*Lupinus*) of the order *Leguminosæ*. The species, of which there are about 80, are sparsely represented in the Mediterranean region and in the Eastern United States, but most numerous in the Western and Pacific Coast States. They have usually digitate leaves; pea-like showy blue, yellow or white flowers in terminal racemes; and rather flattened pods containing several large seeds. Several of the species have been long used for forage, for human food, and for green manuring. Many others are grown for ornament. They thrive especially well upon light, dry soils deficient in lime, and are said to fail upon wet and limy soils. They are readily propagated by means of seed, or, the perennials by division, but these cannot be satisfactorily transplanted when once established. The most important species are the blue lupine (*L. hirsutus*), the white lupine (*L. albus*) and the yellow lupine (*L. luteus*), all of Old World origin. The plants are rich in nitrogenous matter and are thus especially useful for stock-food as well as green manure. Like clover, peas and beans they can obtain free nitrogen from the air by means of their root tubercles. The ripe seeds are rich in proteid substances and but for their bitter would probably be more popular a food than they are even in Europe, wh consumption is enormous. The bitter be removed by long soaking in wa America, though gaining in popularit improvers and forage crops, the plant dom grown except for ornament.

Lupus, a generic term used to describe several varieties of chronic localized infiltrations of the skin. The most common of these are *Lupus erythematosus* and *Lupus vulgaris*. The former occurs in slightly elevated, scaly, red patches, varying in size, which show a strong tendency to the production of atrophic scars. It is most common on the face, ears, and scalp, more rarely occurring on the hands and feet. It begins in several isolated or grouped red spots little larger than a pin-head, and having a thin scale. These spots increase in size by peripheral extension, while the surface is partly covered by the grayish scales or thin scar tissue. The color is characteristic, and is violaceous. They may remain small, or may grow large enough to cover the side of the face. Practically nothing is known of the etiology. The comparatively small patches have little effect on health, but the disseminated variety may cause death.

Lupus vulgaris is a chronic disease of the skin, due to its invasion by the tubercle-bacillus, characterized by one or more brownish-red lumps or patches that tend to absorption, ulceration, and scar formation. The disease usually begins in childhood, the most frequent site being the face, particularly the cheek and nose. There may be one or more such spots, but they show no tendency to symmetrical development. After a time slightly scaly patches will form by the coalescence of the tiny red spots. Sometimes the disease has a slow course, for years remaining quiescent; in other cases it suddenly takes on a rapid growth. The erythematous form is treated by superficial caustics. *Lupus vulgaris* being a tubercular disease, hygiene is of great importance, and the X-rays and other powerful rays seem to exert a curative influence on the growths.

Luray, lū-rā', Va., town, county-seat of Page County; on the Norfolk & Western railroad; about 100 miles north by west of Richmond and the same distance west by south of Washington. It is situated in a beautiful valley almost surrounded by mounains; nearby are a number of mineral springs. A spring which flows through the town furnishes water-power. It manufactures flour, lumber, wagons, carriages, and some agricultural implements and wooden ware. It has a distillery and a large tannery. The Luray College for Young Ladies is located here. Pop. (1900) 1,147.

Luray Cave, in Page County, Va., is near the town of Luray, and on the Norfolk & Western railroad. This cave was discovered by Andrew J. Campbell and companions in August 1878. It is in the limestone belt of the Shenandoah Valley, on the western side of the Blue Ridge, and extends under the low spurs of some of the mountains. The area explored underlies about 100 acres. Electric lights have been put in, and they enable one to see the numerous stalactites, the tiers of galleries, nearly 300 feet in height, the various rooms or cavities, the colors from white to yellow, brown, and red,

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induce him to recant. His replies were made with great boldness and determination, and even after his dispute with Eck at Leipsic in 1519, he still maintained the invalidity of indulgences and of the supremacy of the pope. He appealed from the decision of Cardinal Cajetan to the pope, and from the pope to a general council.

In the year 1519 occurred the famous public disputation, at Leipsic, between Luther and Carlstadt on the one side and Eck on the other, upon the questions at issue. The result [illegible] Both sides claimed the victory, a [illegible] ants parted unchanged in their [illegible] tudes. The Leipsic disputation [illegible] tated a long and bitter controve [illegible] remained as determined in his [illegible] ever. Militz tried once more to [illegible] met Luther for a second time [illegible] But the conference was again [illegible] Luther's position had now grown [illegible] radical, though as yet there was [illegible] plete, and definite rupture with R [illegible] rmal com- troversy by this time had spread [illegible] Germany, and princes and peopl [illegible] arrayed in bitter factions over the issue. Early in 1520 Luther appealed to Charles V., who had succeeded the Emperor Maximilian. He also addressed letters to the bishops [illegible] Merseburg to enlist them in [illegible] bishop of Mainz, in his reply, t [illegible] tions at issue as of a trivial an [illegible] acter, and the bishop of Merse [illegible] Luther's position and exhorts [illegible] Among his friends at this time [illegible] Pirkheimer and Albrecht Dur [illegible] did not follow him when the fo [illegible] Rome came. Ulrich Von Hut [illegible] and urged him forward. Franz [illegible] and Sylvester von Schaumberg [illegible] readiness to put a number of a [illegible] the field for him, should it be [illegible] notable books now appeared from his pen defining his attitude: 'To the Christian Nobility of the German Nation,' and the 'Babylonian Captivity.' In the former he proclaims the universal priesthood and declares against any especially instituted priestly order. He also contests the right of the pope to interpret the Bible, which he declares to be free to everybody. He likewise inveighs against the pope's exclusive right to summon a general council. In the 'Babylonian Captivity' he altogether repudiates the doctrine of indulgences, holds that the papacy is nothing but Babylon, and reduces the sacraments to three only: "Baptism, Penance, and Bread." The latter work was in preparation when the bull of excommunication against Luther arrived in Germany.

The attitude of Luther was more and more one of outspoken opposition to the pope and to the doctrines of the Church itself, and so far had his opposition now advanced that the Roman authorities decided to proceed to extreme measures to crush it. In October 1520, therefore, the memorable bull excommunicating Luther and his friends was published at Leipsic. His writings were burned at Rome, Cologne, and Louvain. The answer to the papal bull was characteristic of Luther. At Wittenberg 10 Dec. 1520 he burned the bull of excommunication and the decretals of the papal canon. By this act he dissolved all connection with the pope and the Roman Catholic Church. Frederick, the elector of Saxony, doubted whether he should protect

erary attainments and with his private friends. He gave advice and assistance wherever it was needed and interested himself on behalf of every indigent person who applied to him. In company he was lively, and abounded in sallies of wit and humor preserved in his ‹Tischreden› (‹Table-Talk›). Luther was no stranger to the elegant arts. His excellent hymns such as ‹Ein' feste Burg,› ‹Aus tiefer Noth,› are well known. His fondness for music, too, was such that he would often relax his mind with composition, with singing, and playing on the flute and lute. Just before his last journey to Eisleben, where he was summoned by the Count of Mansfeld to settle a dispute, he wrote, in a letter to a friend, the following description of his condition: «Aged, worn out, weary, spiritless, and now blind of one eye, I long for a little rest and quietness; yet I have as much to do in writing and preaching and acting as if I had never written or preached or acted. I am weary of the world, and the world is weary of me; the parting will be easy, like that of a guest leaving the inn; I pray only that God will be gracious to me in my last hour, and I shall quit the world without reluctance.» His wife died in 1552. Luther's works are partly in German, partly in Latin. Of earlier editions the most complete is that by Walch (1740–53); and of later, the Erlangen-Frankfort editions (German writings 1826–57; Latin writings 1829–86), and that published at Weimar (1883 et seq.). There are separate collections of his letters and his table-talk. Of accounts of his life may be mentioned those by Meurer (3d edition, 1870); Köstlin (4th edition, 1889), English translation (1883); and Peter Bayne (1887). Consult also Beard, ‹Martin Luther and His Reformation in Germany›; Tulloch, ‹Leaders of the Reformation›; and Lindsay, ‹Luther and the German Reformation› (1900). For Roman Catholic view of Luther consult: M. Evers, ‹M. Luther, Lebens- und Charakterbild› (1883–91); Verres, ‹Luther› (1884); Janssen, ‹History of the German People› (1900).

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Luther League, The, a society organized in 1895 at Pittsburg, Pa., having for its basis the unaltered Augsburg Confession and receiving into membership any one connected with a Lutheran congregation or a Lutheran institution of learning. Conventions are held biennially. The society publishes a monthly journal ‹The Luther League Review.› The organization had a membership of 50,000 in 1901.

Lutheran Church in America. The first Dutch settlers in New Amsterdam, Manhattan Island, in 1623, brought with them the Lutheran creed and church polity, and in 1664 the first Lutheran pastor took up his residence among them. A colony of Lutherans from Sweden and another from Germany were formed in the following centuries; the Swedes settling on the Delaware (1637–42); the Germans being organized and led by Heinrich Melchior Mühlenberg in 1742. The church grew rapidly under capable ministers, and synods were formed in Pennsylvania (1748); New York (1786); North Carolina (1803); and Ohio (1818).

The General Synod, which was intended to constitute a Pan-Lutheran Alliance in the United States, was founded in 1820, and its organization was of great benefit in centralizing and strengthening the activities, both domestic and missionary, of the church. In 1860 it comprised 26 synods, but one of the unfortunate results of the Civil War was to cut off from the northern synods all those south of the Potomac, who formed themselves into what is known as the United Synod of the South. In 1866 the General Synod became divided over the questions of conservatism and liberalism, one party desiring to draw closer the distinctive lines of Lutheran doctrine and polity, the other preferring to Lutheran exclusiveness an inter-communion and a fraternal understanding with other denominations. The conservatives withdrew from the General Synod in 1867. Uniting themselves with the extensive Lutheran Synods formed by immigrants from Germany, Norway, Sweden, and Denmark, they formed the General Council which took as the basis of its creed the Augsburg Confession, The Apology, the two Catechisms of Luther, the Schmalkald Articles, and the Form of Concord.

The Lutheran Church in the United States has grown with great rapidity in the North and Middle West. Its largest body is the Synodical Conference which embraces the flourishing Missouri Synod, whose nucleus was formed by those earnest religious exiles who in 1839 left Saxony for the United States and settled in Missouri. The Rev. C. F. W. Walther was appointed their pastor in 1841; a synod was organized in 1847, and in 1872 the Joint Synod of Ohio, with other smaller synods, combined with the Missouri Synod to form the Synodical Conference. In 1881 a controversy arose in the Conference on the subject of predestination, which the general body of the Conference had adopted into their creed; the Joint Synod of Ohio dissenting from these views separated from the Conference and the ten districts which it comprehends set up an independent organization. The Synod of Iowa is another independent Lutheran Church which differs with the Missouri Conference on the question of the ministry, holding that all ministerial power and office reside in the whole church and not in the spiritual priesthood. The United Norwegian Lutheran Church was formed in 1889 out of a number of Norwegian Lutheran bodies, and now stands for one fourth of the Scandinavian population of the United States.

Besides the independent Lutheran churches above numerated there are three distinct Norwegian and five German Lutheran churches, two Danish synods, one Finnish and one Icelandic synod. While the General Synod is mostly composed of Anglo-Saxon and English-speaking elements, and the United Synod of the South entirely so, the English congregations of the General Council Synodical Conference are in a small minority. Lutherans in the United States are not strictly speaking congregational in polity. Each congregation is generally made by them to be the unit of administrative power both in the representative bodies and in the court of appeal, and from them the synods gain all their authority. But the Missouri Conference and the Joint Synod

Lutheranism. The first of the 95 theses which Dr. Martin Luther affixed to the door of the castle-church of Wittenberg on 31 Oct. 1517, read as follows: «Our Lord and Master, Jesus Christ, saying, Repent ye, would have the whole life of believers to be repentance.» This academic act has been generally looked upon as the inaugural act of the Lutheran Reformation, so much so, that 31 October is to this day celebrated by Lutherans in all lands as the Festival of the Reformation. And the thesis quoted above is perhaps the most concise exhibition of Lutheranism extant. The thesis is, as a whole and in all its parts, a positive doctrinal statement. Doctrine, positive doctrine, is, and was from the beginning, of first importance, the groundwork — the very life — of Lutheranism. The first and foremost task of the Lutheran Church is the promulgation and maintenance of sound doctrine. Preaching, in the Lutheran Church, is not primarily exhortation but teaching, and doctrinal preaching is considered the chief element of Lutheran public worship. Even the better part of Lutheran hymnology is preponderatingly doctrinal. The great bulk of Luther's voluminous writings is doctrinal, and no other church has so extensive a doctrinal literature as the Lutheran Church. Even its controversial theology partakes of this character. It is true, the Lutheran Church in all its best periods was eminently an *ecclesia militans;* but the subjects at issue were again doctrinal. Perhaps the most masterful polemical work in Lutheran, if not in all Protestant theology, Chemnitz' 'Examen Concilii Tridentini,' is also one of the richest storehouses of doctrinal theology.

But doctrine is knowledge communicated. Teaching presupposes or implies a master and a disciple or number of disciples. And of the master Luther says in his thesis: «Our Lord and Master Jesus Christ.» No councils nor synods, no traditions of the Church, no Fathers, early or late, not Luther himself, not any of these, nor all of these together, must be acknowledged as empowered to establish articles of doctrine which every disciple is bound to accept. Bound to accept. For the *Master* is also the LORD. He comes with authority; his teaching is not human but divine. Christian doctrine is not a product of evolution, nor of human speculation, nor of self-consciousness of the church, but the truth of God set forth by the Fountain of divine truth, who has said, «I am the Truth.» He is the one and only authoritative teacher in the church. There is no such thing as an evolution or perfectibility of Christian doctrine. Here the ancient αὐτὸσρα, «He hath said it,» is in its place. Here man has no alternative but either to accept or to reject. Here to add or to modify is to adulterate, and to take away or to yield is to deny. Such is the Lutheran concept of the primary source of Christian doctrine.

But the means also whereby such communication of divine knowledge to man is effected is indicated in Luther's thesis when he says: «Our Lord and Master Jesus Christ, saying, Repent ye.» Here he refers to an express dictum of Holy Scripture. Christ and the Spirit of Christ taught man in the 16th century and teaches man in the 20th century in and through the written Word. Not by awaiting direct revelations, not by following the traditions of the Church or the definitions or decrees of its representatives, are we disciples of Christ, but by searching the Scriptures which were written aforetime for our learning. What is clearly taught in Scripture, that and that only is Christian doctrine. That the Bible is the only and sufficient source of Christian doctrine is the formal principle of Lutheranism.

The material principle of Lutheranism, the cardinal doctrine, around which all other doctrines radiate, because it is the central doctrine of Scripture, is also indicated in the thesis. Luther there describes the subjects and disciples of their Lord and Master Christ as believers. According to the Lutheran concept of Christianity and the Christian church it is faith that constitutes a Christian and a member of the church of Christ, which is simply the whole number of all believers. Christianity, as distinguished from all other religions, is that religion according to which salvation is not by works of righteousness which we have done, but by what God has done in Christ, reconciling the world unto himself. And faith is simply the acceptance of this reconciliation. Not as a work of obedience, with any merit of its own, but only as the acceptance of the merits of Christ, faith is saving faith. It is justifying faith inasmuch as, in view and consideration of the merits of Christ accepted by faith, God in his judgment pronounces the believer righteous. And this doctrine, that God justifies the sinner by His grace, for Christ's sake, through faith, is the material principle of Lutheranism, the cardinal doctrine of Lutheran theology. This doctrine is looked upon by the Lutheran Church as *doctrina stantis et cadentis ecclesiæ,* the doctrine with which the Church stands and falls.

On the other hand, the doctrine of justification, while the central and ruling doctrine, is not the only doctrine of Lutheranism. According to our thesis, Christ would have the whole life of believers to be repentance. This, too, is a doctrinal statement. Repentance, μετάνοια, is a change of heart and mind in man. In his natural fallen state man is wholly evil, spiritually dead in sin, unable to will or to do that which is spiritually good. He cannot, therefore, work his own restoration, nor contribute thereto. But God, prompted by His universal grace, and because of the merits of Christ, the redeemer of all mankind, through the gospel, the ever efficacious and never irresistible means of grace, quickens the sinner into spiritual life, translating him, by the bestowal of faith, from a state of wrath and enmity against God into a state of grace and communion with God. This is the Lutheran doctrine of conversion or regeneration in the stricter sense of the terms. In a wider sense, in which repentance also stands in our thesis, it includes the preservation and growth of spiritual life and its activity in works of the spirit, or sanctification. For while the Lutheran Church maintains that man's salvation is in no sense, manner or measure, his own work, but wholly and solely the work of God, and hence denies the necessity of good works unto salvation, it strenuously asserts that good works are necessary fruits and evidence of faith.

There have been Syncretists, within the pale of the Lutheran Church, who held that the real obstacles to mutual recognition between the

Lutheran Church and others were only two — the doctrines of predestination and of the Lord's supper. But by these assertions Syncretism exhibits itself as thoroughly un-Lutheran in letter and spirit. These differences are indeed, while they stand, insurmountable barriers between the conflicting theologies. But the chasm which separates them is far deeper and wider, a difference of the very fundamental principles which affects a multitude of particular doctrines. The formal principle of Lutheranism is, as we have seen, that of the exclusive authority and absolute sufficiency of the canonical Scriptures in matters of faith. The material principle of Lutheranism is the scriptural doctrine of justification. Lutheranism holds that Christ, the only head and foundation of the church, vested all the rights and powers of the church, the keys of heaven, the power of remitting and retaining sins in his name as his agent, the government and discipline of the church, in the local congregation of believers. Lutheranism maintains that Christ, the only mediator between God and man, has instituted an office in the church, the ministry of the word, for the public administration of the means of grace, that this office is conferred on its incumbent, by Christ's authority through the call of the congregation, and has no power but the power of the word as set forth in the Scriptures, all ministers being equal in rank among themselves. Lutheranism looks upon the Lord's Supper as a means of grace, whereby Christ, by virtue of his words of institution pronounced in the night in which he was betrayed, gives to all communicants his body and blood, really present not by transubstantiation, nor by consubstantiation or the formation of a new substance, but by sacramental union, to be eaten and drunk in, with, and under the consecrated bread and wine, for an assurance of the forgiveness of our sins, procured by his sacrifice on Calvary.

Lutheranism also holds and teaches a doctrine of predestination, not, however, a decree of damnation, but only an election and predestination of the children of God to eternal salvation by faith in Christ Jesus, who is the redeemer not only of the elect, but of all mankind, and by whom the decree of election is determined as by its meritorious cause, and not as an accessory means of execution. Thus, likewise, the gospel and the sacraments, according to the Lutheran concept, are the ordained means, whereby the same universal grace, according to which God earnestly desires the salvation of all men, and, by the power of his Spirit in all cases efficaciously, but in no case irresistibly, exerted through such means of grace, calls, converts or regenerates, sanctifies and preserves to eternal life all those who do not wilfully and obstinately resist the saving grace of God.

Having thus briefly portrayed the nature and principles of Lutheranism, we proceed to a summary sketch of its rise and progress and its spread in the era of the Reformation.

The cradle of Lutheranism was Saxony in Germany. Here, at Wittenberg, the great Reformer taught and preached and wrote under the protection of the Elector Frederick the Wise, and hand in hand with his successors John and John Frederick. The effects of his 95 theses far exceeded the expectations of their author. When Luther published this manifesto, he had no thought of the establishment of a new church. The very name of Lutherans was not adopted by the free choice of those who bore it, but was solemnly inflicted upon them in a Bull published by Pope Leo X. 3 Jan. 1521. By this Bull Luther and his adherents were excommunicated from the Roman Catholic Church, and when Luther had refused to recant at the Diet at Worms, he and the Lutherans were also politically outlawed by an imperial edict, which exposed them to persecution and the death of confirmed heretics. The execution of this edict was suspended in Germany because of the great headway which the Lutheran movement had by this time made, and for various political reasons, which bound the emperor's hands, and at the Diet at Spires, in 1526, the German princes and representatives formally agreed that everyone should so conduct himself toward the edict of Worms as he would deem himself able to answer before God and His Imperial Majesty.

Luther, who had for a time been concealed by the elector in Wartburg castle, had made good use of his enforced rest by translating the New Testament into German and issuing the first installments of his Church Postil, a collection of sermons, from which hundreds of ministers learned how to preach to the people. After his return and during the subsequent years the Lutheran Church in Saxony was organized along conservative lines. Luther provided the congregations with forms of worship and collections of hymns for public service, catechisms for the instruction of young and old and an extensive religious literature. A system of schools of various grades was established throughout the land and an able ministry was educated at the University. The translation of the whole Bible was completed in the course of years. At a second Diet at Spires, in 1529, a majority made an effort to stay the progress of Lutheranism in Germany, and in spite of the protest of the Lutheran members, from which they were called Protestants, these efforts were continued at the Diet at Augsburg, in 1530. Here, however, the Lutheran princes and cities succeeded in presenting to the emperor and Diet and thus publishing to the world, a statement of their faith and doctrine, the Augsburg Confession, which, in the course of time, was adopted as its fundamental creed by the Lutheran Church the world over. (See DIET.) In the same year an apology of the Augsburg Confession was framed and published, which also gained symbolical standing. Although the transactions of the Diet of Augsburg resulted in another proscription of Lutheranism and the inauguration of measures for its extermination, the political conditions of the Empire continued to be such that the emperor and his party could not venture to proceed against the dissenters, and while Luther lived the progress and spread of Lutheranism continued, not only in Germany, but throughout Europe. Even when, after Luther's death, Charles V. marched his armies against his Lutheran subjects and by fraud and force led away into captivity the two foremost of the German Lutheran princes and began the work of stamping out Lutheranism, these reverses, though causing considerable disturbance also within the Lutheran Church, lasted a few years only. The political conditions having once more turned in favor of the suppressed party, the Lutherans, in 1552, by the Treaty of Passau, secured temporary recognition as a church of lawful standing in Germany. This recognition was made permanent by the Peace of Augsburg, in 1555. This settlement included the Lutherans only of all those who dissented from the Roman Catholic Church, Zwinglians, Calvinists, Anabaptists, and others, being excluded. It was thus menacing the religious as well as the political status of Lutheranism, when men of influence in Saxony, the Cryptocalvinists, by clandestine operations endeavored to change the Lutheran Church of Saxony into a Calvinistic establishment. At the same time a number of doctrinal controversies threatened to vitiate the orthodox character of the church of the Augsburg Confession, until, by the united labors of Lutheran theologians and princes, sound in doctrine and deeply concerned about the peace of the church and the purity of its doctrine, the last of the great Lutheran Confessions, the Formula of Concord, closed the series of Lutheran standards, all of which, the Augsburg Confession, its Apology, the Smalcald Articles, Luther's Large Catechism, Luther's Small Catechism, the Formula of Concord, together with the three ancient Ecumenical Creeds of all Christendom, constitute the body of Lutheran Symbols, known as the Book of Concord of 1580.

While Germany was the home of the Lutheran Church, Lutheranism obtained a permanent foothold and became the church of the realm in a number of extra-German countries during the period of the Reformation.

In Sweden Luther's doctrine was disseminated as early as 1519 by two brothers, Lars and Olav Petersen, who had studied at Wittenberg. Under Gustavus Vasa, Lars Petersen was made professor of theology at the University of Upsala, and Olav Petersen was the leading preacher at Stockholm. The Bible was translated into Swedish and at the Diets of Westeras, 1527, at Orebro, 1529, and at Westeras, 1544, the organization of the Swedish Lutheran Church as a national church with an episcopal form of government was effected.

The first Lutheran preachers in Denmark were Peter Lille and Hans Tausen. The organizer of the Danish Lutheran Church was John Bugenhagen, pastor of Wittenberg, who came to Denmark in 1537 and prepared the new Constitution, which was adopted at Odense in 1539. Soon after Norway and Iceland were also Lutheranized, and thus the Lutheran Church was permanently established without bloodshed throughout all the Scandinavian countries.

In Prussia the Lutheran Church was planted and made the church of this ancient territory of the German knights under John George of Polenz, bishop of Samland. The new Agenda and Church-Order was introduced in 1525 and 1526, and the new Lutheran University of Königsberg was a colony of Wittenberg, of which Sabinus, Melanchthon's son-in-law, was the first rector.

In Silesia Luther's doctrine was preached as early as 1518. John Hess was called as a Lutheran minister by the city council of Breslau.

In Poland Luther's writings were prohibited. But in 1521 the Bible was translated into Polish. Jacob Knade preached at Danzig. From Danzig Lutheranism spread to Elbing and Thorn, and by 1548 the Polish Church was pr[illegible]atingly Lutheran.

In the Baltic territories, Riga, Dorpat, and Reval were Lutheran in 1523, and within two decades the Reformation spread throughout these whole regions.

In Hungary the doctrines of the Reformation were promulgated by men who had been Luther's students at Wittenberg. In 1549 five free cities adopted the Augsburg Confession, and under the influence of the schools [illegible] numerous elementary and advanced [illegible] opened in cities and villages throughout Hungary. Merchants who returned from the fair at Leipsic brought Luther- [illegible] Transylvania, and others, who had [illegible] at Wittenberg, promoted its spread [illegible] an school was opened at Hermannstadt [illegible] 1533 John Honter labored as "Evangelist of [illegible] Lord at Kronstadt," and the Reformation [illegible] its course from town to town. In cities [illegible] villages and in the open country schools [illegible] established, and even in the village [illegible] Latin and Greek were taught. With the [illegible] libraries for the people were connected, [illegible] dowments were provided for the sup[illegible] young men who were willing to study [illegible] man universities.

In Bohemia and Moravia a large part [illegible] population embraced the Lutheran faith [illegible] Luther's lifetime, and when, after the former's death, the emperor made war [illegible] the Lutherans in Germany, the Bohem[illegible] therans refused to take up arms agai[illegible] brethren in the faith.

In the Netherlands, also, the church [illegible] Reformation gained headway, pr[illegible] through the reading of Luther's wo[illegible] Antwerp a great Lutheran moveme[illegible] place, brought on by the preaching of [illegible] and Cyriacus Spangenberg, in 1565 a[illegible] But it was not long before Lutheran [illegible] were prohibited. The Dutch Reformed [illegible] was organized in 1568 and 1571 and pr[illegible] the church of the realm in 1583. W[illegible] Spaniards in possession of Antwerp, the Lutherans scattered and founded [illegible] gations in Frankfort, Hamburg, Am[illegible] Leyden, and other cities. Even there [illegible] no rest. In Amsterdam they were an[illegible] and Lutheran services were again p[illegible] Still, the Lutheran congregations co[illegible] enjoy a rapid and steady growth; so [illegible] that a scarcity of ministers began to [illegible] painfully felt. The Lutherans in H[illegible] made the great mistake of neglecting the establishing of schools and colleges for the education of ministers, and this eventually brought about their decadence; for the importation of preachers from foreign countries was accompanied by the introduction of unionistic, syncretistic doctrines and practices.

France is another country in which Luther's writings were widely circulated and had great influence in the church. A Lutheran congregation was organized at Maux. Faber Stapulensis, Briçonnier, Jean and Pierre Leclerc were some of the most noted preachers. Lefèvre translated the Bible into French. A sound Lutheran movement promised a bright future for Lutheranism, but the influence of Geneva, the stronghold of the Reformed Church, was very strong in France, and through this influence the Lutheran movement in France was directed into other channels.

In England Luther's books were read as early as 1519, especially at the universities, where they were of vast influence. Great efforts were made to suppress these books, and they were proscribed very early, but this only had the effect that they were now read more than ever. Thomas Cranmer embraced the Lutheran faith, and, though in many ways inconsistent, he remained a Lutheran in doctrine until the year 1548. A collection of Lutheran hymns was published, being translations of German hymns, most of them Luther's. In 1536 the Augsburg Confession was printed in an exquisite translation by Taverner. In Sarcerius' ‘Commonplaces,’ a Lutheran handbook of Dogmatic Theology was given the English people. Cranmer, in the same year, at the close of which he abandoned Lutheranism, wrote an extensive explanation of Luther's Small Catechism, in which the first English translation of Luther's Small Catechism by Cranmer's hand was embodied. The death of Henry VIII., whose political ambition had been to make himself the head of the Lutheran League of the continent, the personal acquaintance of many English and Scotch refugees with Calvin at Geneva and the imposing work there being reared, and other reasons contributed to the ascendency of Calvinism in England and Scotland, and the Lutheran movement became virtually extinct about the middle of the century.

For Lutheranism in America see LUTHERAN CHURCH IN AMERICA, THE.

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Luther's Hymn, a name given to a celebrated German hymn composed by Luther about 1521. It was entitled “Ein' feste Burg ist unser Gott.”

Lützen, lüt'sĕn, Germany, small town of Prussian Saxony, nine miles southwest of Leipsic. It derives all its interest from the two battles fought in its neighborhood. The first belongs to the Thirty Years' war, being fought on 16 Nov. 1632, between the Swedes under Gustavus Adolphus, and the imperialists under Wallenstein. The Swedish monarch, having joined his forces with those of Bernard, Duke of Saxe-Weimar, attacked the enemy in a strongly intrenched position. The issue was long doubtful, but the Swedes finally triumphed, though Gustavus fell in the action. The place of his death is marked by a square block of granite, called the Schwedenstein (the Swedes' stone). The second battle was fought 2 May 1813, somewhat farther south, at Gross-Görschen. It was the first important conflict between the allied Russian and Prussian armies and the French under Napoleon in that decisive campaign. The French numbered 115,000, while the allies had only 70,000. Napoleon maintained his position, though at a loss of 12,000 men, against 10,000 of the allies killed and wounded. The allies retreated in good order. Pop. about 5,000.

Lützow, lüt'sō, F., COUNT, Austrian author. He has been chamberlain of the Emperor of Austria from 1881. He has published ‘History of Bohemian Literature’ (1899); ‘Prague,’ in ‘Mediæval Towns’ series (1901); etc.

Lützow, Karl von, German historian of art: b. Göttingen 25 Dec. 1832; d. 1897. He assisted Lübke (q.v.) in editing ‘Denkmäler der Kunst’ and in 1867 became professor of the Polytechnicum, Munich. He published ‘Munich Antiques’ (7 vols., 1861–9); ‘Masterpieces of Ecclesiastical Architecture’ (1862); ‘Monuments of Art,’ with Lübke (6th ed. 1892); ‘History of German Copperplate and Wood Engraving’ (1891). He was the founder, in 1866, of the ‘Zeitschrift für bildende Kunst’ and edited it till his death.

Luverne, lū-vėrn', Minn., village, county-seat of Rock County; on the Rock River, and on the Chicago, St. P., M. & O. and the Chicago, R. I. & P. R.R.'s; about 200 miles southwest of Saint Paul, and 30 miles northeast of Sioux Falls, S. Dak. Luverne is situated in an agricultural region in which are granite quarries and fire-clay deposits. The chief industrial establishments are flour-mills, grain elevators, brick and lumber yards, and creameries. Large nurseries are in the vicinity. The trade is principally in flour, granite, grain, live-stock, nursery products and dairy products. Pop. (1890) 1,466; (1900) 2,223.

Luxembourg, François Henri de Montmorency-Bouteville, frăṅ-swä ŏṅ-rē dė mônmō rŏṅ sē boo-tē-vēl lük-sŏṅ-boor, DUKE OF, marshal of France: b. Paris 8 Jan. 1628; d. Versailles, 4 Jan. 1695. He served when young under the Prince of Condé; in 1662 was made a duke and peer of France, and in 1667 lieutenant-general. In 1672 he commanded during the invasion of Holland; and having gained the battle of Senef in 1674, was created a marshal of France. In the war of France against England, Holland, Spain, and Germany he won the three great battles of Fleurus (1690), Steenkerken (1692), and Neerwinden (1693).

Luxembourg (lŭk'sĕm-bėrg, Fr. lük-sŏṅ-boor) **Palace**, a structure famous for its architecture, art gallery and gardens; situated in Paris, in the Rue de Vaugirard. It was begun in 1616 and completed in 1620; was altered in 1790, and was much enlarged in 1836. At this latter date a magnificent semicircular hall was built for the session of the House of Peers, and later for the Senate. The Senate hall was burned in 1859, but was soon after rebuilt. The name of the palace is derived from the Duke of Piney-Luxembourg, whose mansion once stood on the same site. From 1870 to 1879, the palace was occupied by the Prefecture of the Seine and the Paris municipal council. Since 1879 it has been again occupied by the Senate. It contains a splendid museum of modern art, the most important contemporary collection in the world. The gardens are of the Renaissance order and the most noted in France.

Luxemburg (Fr. lük-sŏṅ-boor, Ger. look'-sem-boorg), **Grand-duchy of**, northwestern Europe, an independent state, bounded north, east and south by Germany, southwest by France, and west by Belgium; greatest length, north to south, 55 miles; greatest breadth, 34 miles; area, 998 square miles. It forms part of the plateau of the Ardennes, and has a rugged and mountainous surface, covered in many parts with heaths and morasses, though in general well wooded. Its drainage belongs almost entirely to the basin of the Moselle. Agriculture is limited in extent by the nature of the surface, but the pastures rear great numbers of cattle, sheep, and horses, the last long in high repute for light cavalry. Considerable quantities of iron are smelted from the ore of the duchy. The inhabitants are mostly of German origin, but French is the language of the educated classes and of business. The people are for the most part Roman Catholics. Pop. (1900) 236,543. Luxemburg, in early times formed a part of Germany. In 1354 it was erected into a duchy by Charles IV. In 1814 it was converted into a grand-duchy under the king of Holland. Though governed by the Dutch kings as grand-dukes it was distinct from the kingdom of Holland; and on the death of Willem III. in 1890 it passed over to Adolf, Duke of Nassau. It is included in the German Customs Union, and formerly was a member of the German Confederation. Capital, Luxemburg.

Luxemburg, the capital of the grand-duchy of the same name, situated 117 miles southeast of Brussels and 34 miles north of Metz. Its natural position is so strong, and the different powers into whose hands it successively fell did so much to extend and improve its means of defense, that it was called «the northern Gibraltar.» From 1839 till 1866 it was garrisoned for the Germanic Confederation by Prussian troops, but in accordance with the Treaty of London (1867) the fortifications were dismantled, the Prussians withdrew their troops, and the neutrality of the duchy was guaranteed by the great European powers. It is divided into a low and a high town. The former lies along the banks of the Alsette. The latter stands 200 feet higher, on a plateau with precipices on three sides, the surrounding ravine being crossed by great viaducts. The town is well built; contains a town-house, government-house, house of deputies, old cathedral church, Athenæum, Roman Catholic seminary for priests, grand-ducal palace (rebuilt 1893–4), a handsome public park, etc. It has manufactures of machinery, leather gloves, breweries, dye-works, etc.; and a considerable trade. Luxemburg is the see of a bishop; and during part of the year is the residence of the leading families of the duchy. Its neighborhood abounds with fine promenades and picturesque features of various kinds. Pop. (1900) 20,298.

Luxor, lŭk'sôr or look'sôr, Upper Egypt, a village on the right bank of the Nile, occupying the site of ancient Thebes and containing splendid ruins of that historic metropolis. See Thebes.

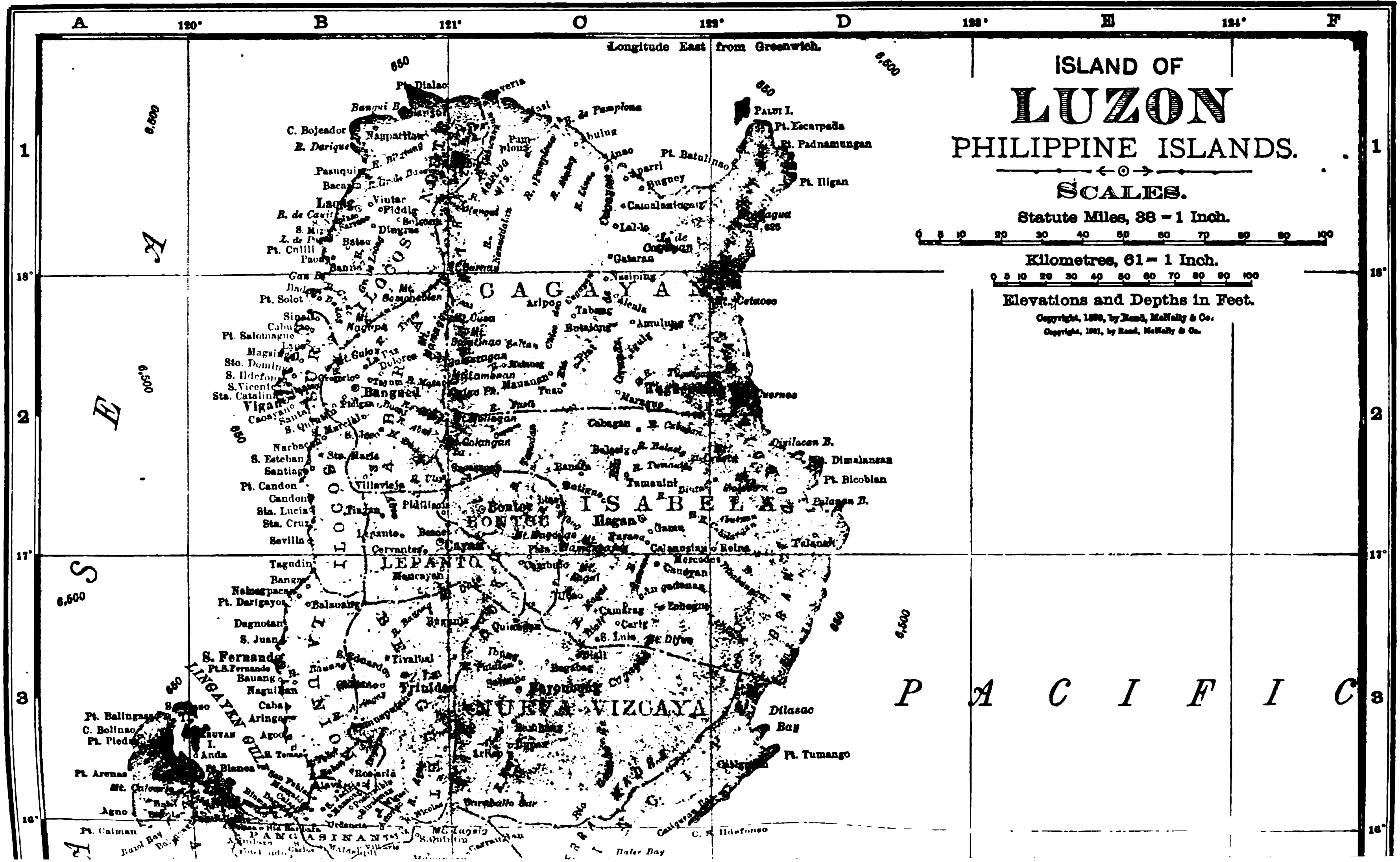
Luzac, Jean, zhŏṅ lü-zăk, Dutch philologist and publicist: b. Leyden 1746; d. there 1807. He was of a French Protestant family, was educated for the bar at The Hague, and in 1772 became one of the editors of the ‘Leyden Gazette,’ a journal of European reputation, controlled since 1738 by his father and uncle. For several years subsequent to 1775 he was its sole editor, in which capacity he became known as a friend or correspondent of Washington, Adams, Jefferson, and many eminent Europeans. He subsequently became Greek professor at the University of Leyden, and in 1795 published an address ‘De Socrate Cive,’ dedicated to John Adams, whose son, John Quincy Adams, had studied under his direction. During the revolutionary troubles in Holland he was forbidden to lecture on Greek history to his classes; and having refused to obey this injunction, was deprived of his professorship, which was, however, restored to him in 1802 with an increase of salary. Upon being suspended from his professional functions he received a letter from Washington, expressing sympathy in his behalf, and encouraging him to hope for justice. His ‘Lectiones Atticæ,’ a defense of Socrates, was published in 1809.

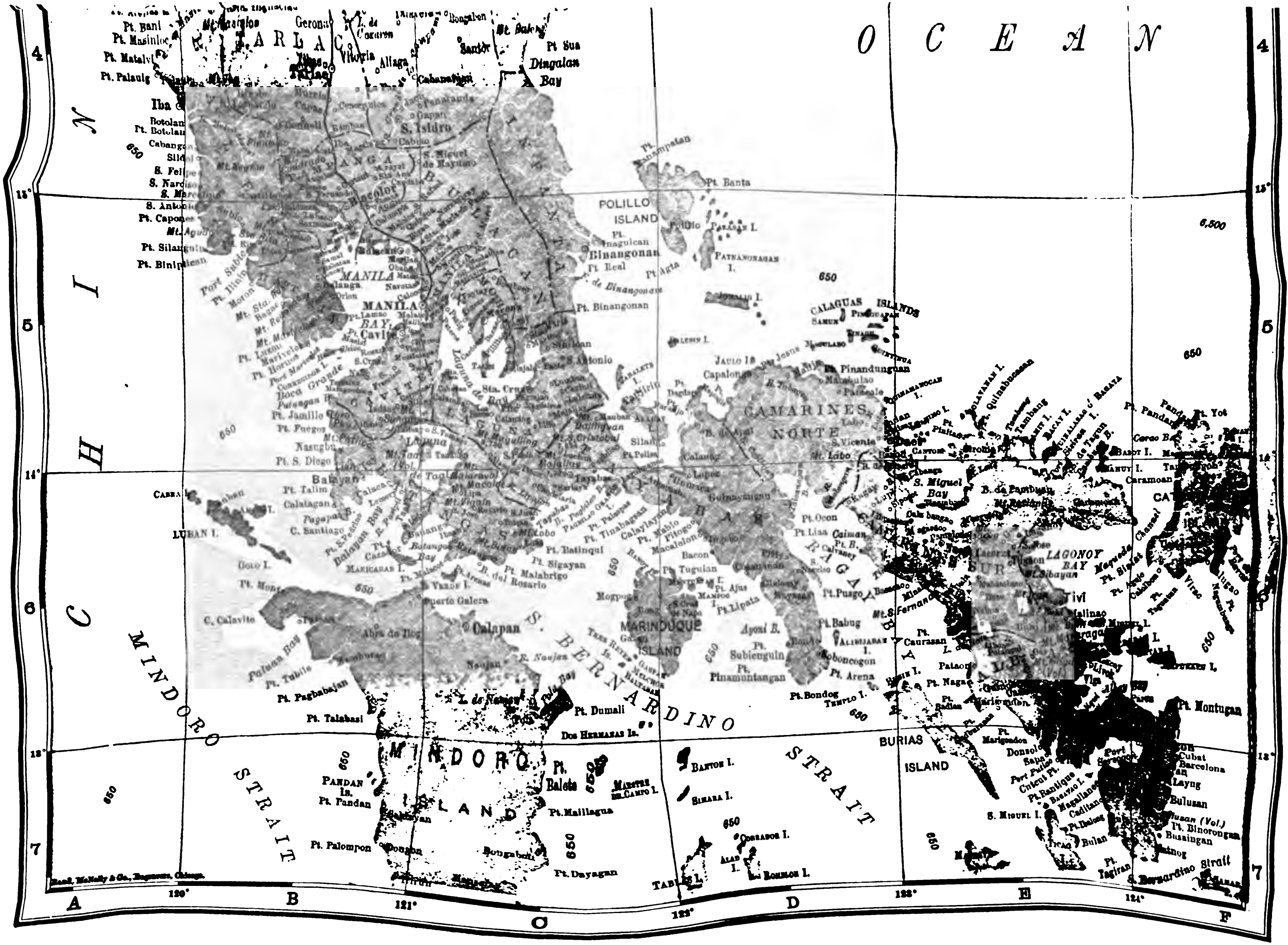
Luzenberg, loo'zĕn-bėrg, **Charles Aloysius,** American physician: b. Verona, Italy, 1805; d. 1858. Leaving Italy for the United States in his 14th year, he subsequently received a medical education at the Jefferson Medical College of Philadelphia. He removed to New Orleans in 1829, where he made a reputation for brilliant surgery and was enabled to establish the famous New Orleans Medical School. He visited Paris in 1832, where his reputation had preceded him, and he was elected corresponding member of the Paris Academy. His most important work in Louisiana (where he took up his residence again in 1834) was the founding of the Society of Natural History (1839), and the Louisiana Medico-Chirurgical Society (1843), by which science has been much fostered and promoted in the South.

Luzerne, lū-zėrn, N. Y., village, in Warren County; on the Hudson River, at the mouth of the Sacondaga River; about 20 miles north of Saratoga and 10 miles southwest of Lake George. Lake Luzerne is in the vicinity. The village is situated in an agricultural and lumbering region, and its chief industries are connected with the manufacture of lumber and with farm products. A bridge crossing the Hudson connects Luzerne with Hadley, a station on a branch of the Delaware & Hudson railroad. The cool climate in this region, in summer, the beautiful scenery, and the opportunities for fishing make it a favorite summer resort. Pop. (1900) 1,341.

Luzon, loo-zŏn' (Sp. loo-thōn'), Philippines, the northernmost island of the Philippine archipelago, lying south-southwest of Japan and south-southeast of China. On the north is the Bachi channel, connecting the Pacific Ocean and the China Sea; on the south are the San Bernardino Strait, separating it from Sámar, the channels of the Visayan Sea, and the Tayabas gulf, dividing it from Mindoro.

Topography and Physical Geography.— The island is very irregular in shape, elongated from north to south and southeast, and much wider at the north than at the south. It narrows at lat. 14° 30' where the bay of Manila is, and much more at lat. 14° between Lamón Bay and Tayabas Bay, where an isthmus unites the larger and northwestern part of the island with the smaller southeastern part; it is thus divided into three territorial divisions, Northern Luzon, Central Luzon, and Southern Luzon. The length of Luzon is 283 miles from the north coast to Manila, and from there 225 miles southeast to Babulgun Point; at its widest point near the centre of Northern Luzon it is 138 miles wide; at its narrowest point, the isthmus in lat. 14°, 8 miles wide; area, 43,075 square miles, with dependent islands 44,235 square miles. The mountain system of Luzon consists of three large ranges, the nucleus of which is Caraballo de Baler in the province of Neuva Ecija. The Carabellos Occidentales form the watershed of Northern Luzon, and extend about 150 miles near the western coast and parallel with it; the


ISLAND OF
LUZON
PHILIPPINE ISLANDS.
SCALES.
Statute Miles, 38 = 1 Inch.
Kilometres, 61 = 1 Inch.
Elevations and Depths in Feet.
Copyright, 1898, by Rand, McNally & Co.
Copyright, 1901, by Rand, McNally & Co.
Longitude East from Greenwich.
A
B
C
D
E
F
1
2
3
120°
121°
122°
123°
124°
18°
17°
16°
CHINA SEA
PACIFIC
CAGAYAN
ISABELA
ILOCOS NORTE
ILOCOS SUR
ABRA
LEPANTO
BONTOC
NUEVA VIZCAYA
LA UNION
PANGASINAN
LINGAYEN GULF
Laoag
Vigan
Bangued
Aparri
Ilagan
S. Fernando
Dilasac Bay
Pt. Tumango
Palui I.
Pt. Escarpada
Pt. Padnamungan
Pt. Iligan
Pt. Dialao
C. Bojeador
Pt. Candon
Pt. Bolinao
6,500
650


OCEAN
CHINA
MINDORO STRAIT
S. BERNARDINO STRAIT
MINDORO ISLAND
MANILA
MANILA BAY
Cavite
Laguna de Bay
POLILLO ISLAND
CALAGUAS ISLANDS
CAMARINES NORTE
MARINDUQUE ISLAND
BURIAS ISLAND
LAGONOY BAY
RAGAY BAY
S. Miguel Bay
LUBAN I.
Calapan
Puerto Galera
Abra de Ilog
Paluan Bay
C. Calavite
Pt. Banta
Binangonan
Pt. Binangonan
Patnanongan I.
Jaulo Is
Capalonga
Pt. Pinandungan
Mt. Labo
Pt. Ocon
Pt. Lisa
Caiman
Pt. Pugo
Mt. S. Fernando
Pt. Babug
Ayoni B.
Pt. Subienguin
Pt. Pinamuntangan
Pt. Arena
Pt. Bondog
Templo I.
Pt. Nagas
Caurasan
Pataon
Tivi
Malinao
Virac
Pt. Montugan
Bulusan
Pt. Binorongan
Busaingan
S. Bernardino Strait
Pt. Tagiran
Bulan
S. Miguel I.
Donsol
Port Sorsogon
Barcelona
Layng
Cubat
Caramoan
B. de Pambujan
Pt. Pandan
Pt. Yot
Cerco B.
Quinabucasan
Tambang
Bacay I.
Pt. Tinabagan
Pt. Balinqui
Pt. Sigayan
Pt. Malabrigo
B. del Rosario
Verde I.
Maricabán I.
C. Santiago
Calatagan
Pt. Talim
Balayan
Balayan Bay
Batangas Bay
Pt. S. Diego
Nasugbu
Pt. Fuegos
Pt. Jamillo
Boca Grande
Corregidor I.
Mariveles
Mt. Mariveles
Port Sablé
Pt. Iliniq
Moron
Pt. Binirican
Pt. Silanguin
Mt. Aguado
Pt. Capones
S. Antonio
S. Marcelino
S. Narciso
S. Felipe
Silod
Cabangan
Pt. Botolan
Botolan
Iba
Pt. Palauig
Pt. Matalvi
Pt. Masinloc
Pt. Bani
TARLAC
Tarlac
Vitoria
Aliaga
Cabanatuan
Gerona
Bongabon
Pt Sua
Dingalan Bay
Mt. Baler
S. Isidro
PAMPANGA
S. Miguel de Mayumo
Bacolor
BULACAN
INFANTA
Tayabas
Lucban
Mauban
Atimonan
Gumaca
Lopez
Calauag
Guinayangan
Pt. Tugulan
Pitogo
Macalelon
Bacon
Mogpog
Gasan
Tres Reyes Is.
Naujan
Pt. Dumali
Dos Hermanas Is.
Pt. Baleto
Maestre de Campo I.
Banton I.
Simara I.
Cobrador I.
Alad I.
Romblon I.
Tablas I.
Pt. Dayagan
Bongabon
Pt. Maillagua
Pt. Palompon
Pt. Pandan
Pandan Is.
Pt. Talabasi
Pt. Pagbabajan
Pt. Tabile
Golo I.
Pt. Mon
Cabra I.
650
6,500
120°
121°
122°
123°
124°
13°
14°
15°
A
B
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Rand, McNally & Co., Engravers, Chicago.

Sierra Madre range, starting at Carabello de Baler, extends northeast to Cape Engaño; the Carabellos Sur, starting at the same point, extends south to Banahao, then turns to the southeast and terminates near the straits of San Bernardino. This range has several important branches, one ending on the south side of the bay of Baler. Among the more important single mountains the following may be mentioned: Data (8,333 feet), and Burnay (6,376 feet), of the Carabellos Occidentales; Cana (3,830 feet) of Sierra Madre; and Bulusan and Mayón (7,566 feet) of the southern range. The three last mentioned are volcanos, of which Mayón is the most active. Luzon is well watered; the longest river is the Grande de Cayagán, running nearly the whole length of Northern Luzon; three other large rivers traverse this part of the island, and there are numerous smaller streams. The coast is irregular, and there are numerous bays and excellent ports and harbors, especially on the central and southern coasts.

Commerce and Industries.—There are a number of fine roads in Luzon, which centre at Manila, connecting it with remote points; there is also a railroad from Manila to Dágupan. In 1903 three other railroad lines were proposed, one from Manila to Aparri, following the Pampanga, Magat and Cagayan rivers, another from Manila to Batangas, skirting the west shore of the Bay Lagoon between Muntinlupa and Calamba, and a third from Dágupan to Laoag. All the staple crops of the archipelago grow in abundance, and the chief industries of the island are agriculture, and the development of the products into the advanced forms of manufacture; the mechanical industries are very largely confined to Manila. Luzon is also rich in forests, having all the woods used in building, as well as the gum-producing, medicinal, and dye trees.

Luzon was the first of the Philippine islands to come under the control of the United States; it was the scene of the earliest military operations against the insurgents, and the base of operations for campaigns of occupation of the other islands. The beginning of civil government under the auspices of the United States was coincident with the occupation of Luzon, and the island is now the seat of the authority of civil government as well as of military domination. Civil government has been established throughout the whole island. The provinces into which Luzon is divided are as follows:

Abra.
Albay.
Ambos Camarines (Norte and Sur).
Bataán.
Batangas.
Benguet.
Bulacan.
Cagayan.
Ilocos (Norte and Sur).
Isabela.
Laguna.
Lepanto-Bontoc.
Nueva Ecija.
Nueva Vizcaya.
Pampanga.
Pangasinán.
Rizal.
Sorsogón.
Tárlac.
Tayabas.
Unión.
Zambales.

See PHILIPPINE ISLANDS, and the names of individual provinces.

Lyall, lī'al, SIR **Alfred Comyn,** English author and civil servant: b. 1835. He was educated at Eton, entered the Bengal civil service, and was governor of the Northwest Provinces, India, 1882–7. He has published ‹Verses Written in India›; ‹British Dominion in India›; ‹Asiatic Studies›; ‹Life of Warren Hastings.›

Lyall, Edna. See BAYLY, ADA ELLEN.

Lyall, James, American inventor: b. Auchterarder, Scotland, 13 Sept. 1836; d. New York 23 Aug. 1901. He was brought to this country as a child; when old enough worked at loom-making in his father's shop; was a soldier of the 12th New York infantry during the early part of the Civil War; and afterward became a manufacturer of jute and cotton goods and of machines. He designed corset-making machinery and produced the first machine-made corsets ever manufactured. He also invented a waterproof varnish, and in the latter part of the war knapsacks and haversacks waterproofed by his process were largely used in the Union army. The Lyall positive-motion loom, for weaving wide fabrics, was invented by him in 1863. Various other inventions of his are much employed in cotton manufacture. He received many medals and decorations, including the gold medal of honor from the American Institute, bestowed on him in 1869.

Lycan'thropy. See WERE-WOLF.

Lycaon, lī-kā'ŏn, a mythical king of Arcadia, generally represented as a son of Pelasgus by Melibœa, daughter of Oceanus, and described by some as the first civilizer of Arcadia, by others as a barbarian who defied the gods. He became by several wives the father of a great number of sons, so notorious for arrogance and impiety that Jupiter resolved to punish them. Appearing to them at their dwelling in Arcadia disguised as a poor man, they invited him to a repast, at which was served up the flesh of a boy whom they had murdered. The god rejecting the food, transformed Lycaon and all his sons save one into wolves, or according to other accounts destroyed them by a flash of lightning. The flood of Deucalion was said by some to have been a consequence of the crimes of the Lycaonidæ.

Lycaonia, lĭk-ạ-ō'nĭ-ạ, Asia Minor, the name of an ancient division which was bounded north, east, south, southwest and west by Galatia, Cappadocia, Cilicia, Isauria and Phrygia, and is now included in the Turkish province of Caramania. Lycaonia is first mentioned in Xenophon's history of the expedition of the younger Cyrus as belonging to the Persian empire. After its conquest by Alexander and his death, it was attached to the kingdom of Syria, and subsequently came into the possession of Eumenes, king of Pergamus, while the other part was ruled by native chieftains. In the latter half of the 1st century B.C. it was conquered by Amyntas, king of Galatia, with which country it passed on his death to the Romans under Augustus, being annexed to the province of Cappadocia. The inhabitants, according to the Acts of the Apostles, spoke a peculiar dialect. They were warlike and skilled in archery. The principal town was Iconium, now Konieh.

Lyceum, lī-sē'ŭm, an academy in ancient Athens in which Aristotle explained his philosophy. In modern times the name of lyceum has been given to the schools intended to prepare young men for the universities. In France the term is applied particularly to an intermediate classical school. In the United States the term is only applied to the lecture plaform, and is occasionally used as a title for a public ball or assembly room.

Lych-gate. See Lich-gate.

Lychnis, lĭk'nĭs, a genus of plants of the pink family (*Caryophyllaceæ*) comprising many species well known both as flowering weeds in waste places throughout the northern hemisphere, and as garden ornaments. They have a five-toothed naked calyx, five-clawed petals, ten stamens, and five styles, with flowers generally in terminal corymbs. Ragged Robin, or cuckoo-flower (*L. flos-cuculi*), a fugitive from Europe, is now common in damp meadows in the eastern part of the United States, and has a pretty flower with rose-colored petals; White campion (*L. alba*) is another species naturalized from Europe; as also are the red campion (*L. dioica*), the corn-cockle (q.v.), and some others. Many foreign species are cultivated in gardens, among which are the scarlet lychnis (*L. chalcedonica*) and the mullein-pink (*L. coronaria*). Two or three species are indigenous to Labrador and the Hudson Bay region.

Lycia, lĭs'ĭ-ạ, Asia Minor, an ancient maritime province, bounded by Caria on the west, Pamphylia on the east, and Pisidia on the north. Its fertility and populousness are attested by the 27 cities mentioned by Pliny, which formed a confederated republic, with a congress which regulated the public concerns, and a president called the Lyciarch. Lycia was colonized by the Greeks at a very early period, and its historical inhabitants were Greeks, though with a mixture of aboriginal blood. They and the Cilicians were the only people west of the Halys whom Crœsus did not conquer, and they were the last who held out against the Persians. Consult Fellows, 'Account of Discoveries in Lycia' (1841).

Lyc'ium, a genus of shrubby and thorny vines of the order *Solanaceæ*, and allied to *Datura* (q.v.), about 75 species of which are scattered throughout the temperate and warm parts of the world. Of the American species none is noteworthy except one naturalized from Europe called box-thorn or matrimony-vine (*L. vulgare*), which bears funnel-form flowers, purplish changing to greenish, and red ovate berries.

Lycomedes, lĭk-ō-mē'dēz, legendary king of the island of Scyros. He was the son of Apollo and Parthenope, and Thetis gave to him the charge of her son Achilles, disguised in woman's apparel, to prevent his going to the Trojan war.

Lycoperdaceæ, lī"kō-pĕr-dā'sē-ē. See Fungi.

Lycophron, lī'kŏf-rŏn, Greek poet and grammarian: b. Chalcis, Eubœa, 3d century B.C. He lived at Alexandria, under Ptolemy Philadelphus (283–247), whose favor he won by the invention of anagrams. Of all his writings there remains but one tragedy, 'Cassandra' (Alexandra), written in iambics. It has no pretensions to poetical merit, and is but a cumbrous store of learning and obscure allusions. It is, properly speaking, a continued soliloquy, in which Cassandra predicts the fall of Troy, and the fate of all the heroes and heroines who shared its ruin. It affords some information of value respecting antiquities and mythology.

Lycopodiales. See Ferns and Fern-allies.

Lycopo'dium, the principal genus of club-mosses (q.v.), containing many species of the northern hemisphere, of which several belong to the United States. They are low creeping evergreen plants. A common example is the ground-pine (*L. clavatum*), which creeps upon the ground in heathy tracts with long branching stems. *L. rubrum* is a violent cathartic, and has been used successfully in Spanish America in cases of elephantiasis. *L. clavatum* and *L. selago* excite vomiting. The yellow powder contained in the spore-cases of all the species is very inflammable, and is employed in the manufacture of fireworks, and in the flashing of torches or production of mimic lightning on the theatrical stage. It is also employed to cover pills, so as to prevent them being acted upon by moisture, and is known in England under the name of lycopode or vegetable brimstone, and in Germany as *Blitzmehl* or *Hexenmehl* (lightning meal or witches' meal). Many of the species are prized for their beauty, and are cultivated in hot-houses or fern-cases, where they thrive well.

Lycurgus, lī-kėr'gŭs, Spartan lawgiver; flourished in the 9th century B.C., according to the commonly received traditions. He was the youngest son of the Spartan king Eunomus. His eldest brother, Polydectes, succeeded his father in the government, but died soon after. His wife proposed to Lycurgus to destroy her unborn child by her late husband, if he would share the throne with her. When she gave birth to a son, Charilaus, Lycurgus proclaimed him king, and became his guardian. Being desirous of examining the political constitutions of other lands, Lycurgus left Sparta. On his return the entire community requested him to draw up a constitution for them. He undertook the task. The old constitution was completely remodeled; the highest position in the state was to be shared by two kings, whose powers were counterbalanced by a senate (*gerousia*). The people obtained a voice in public affairs. The native race or Lacedæmonians were confined to the pursuits of trade, commerce, and agriculture; the Helots or slaves to all those menial employments which a freeman would consider as a disgrace, while the Spartans became the warriors of the state. Lycurgus also introduced a redistribution of property. Obtaining from the god at Delphi an approving oracle for his institutions, he exacted a promise from his countrymen not to make any alterations in the laws before his return from a journey he was about to make. He then left Sparta, determined to finish his life in voluntary exile, in order that the Spartans might be bound by their oath to preserve his consitution inviolate for ever. The time and place of his death are unknown.

Lycurgus, one of the ten Attic orators: b. Athens 396 B.C.; d. there 325 B.C. He was a pupil of Plato and of Isocrates. In 343 he was sent with Demosthenes on an embassy to counteract the intrigues of Philip. He won his chief glory as guardian of the public revenue 338–326 B.C. The decree of the Athenians commending his administration of this trust (307 B.C.) is still extant. He was also appointed superintendent of the city, and censor, and in the latter capacity caused his own wife to be fined for violating one of his sumptuary enactments. Of the prosecutions which he conducted, the most celebrated was that against Lysicles, who had commanded the army of Athens at Chæronea; Lysicles was condemned to death. There were 15 orations of his extant in the ages of Plutarch and Photius, but all have since perished except that against Leocrates, and some fragments.

Ly'dekker, Richard, English naturalist: b. 1849. He was educated at Cambridge University and was a member of the staff of the Geological Survey of India 1874–82. He prepared for the British Museum in 1884 a catalogue of the fossil mammalia, reptilia and birds therein, and was in Argentina, 1893–4, to examine the mammals in the La Plata Museum. Among his numerous publications are: 'Phases of Animal Life'; 'Geological History of Mammals'; 'The Deer of All Lands' (1898); 'Wild Oxen, Sheep, and Goats of All Lands, Living and Extinct' (1898); 'Descriptions of South American Fossil Animals.'

Lyd'dite, a high explosive which was adopted by the English government in 1888 for charging its torpedo-shells. Its composition has been varied from time to time, but a typical formula is picric acid 88 per cent, dinitrobenzene 8 per cent, and vaseline 4 per cent. These materials are melted and mixed together in a water-bath, and while in the fused condition they are poured into the shells, where, on cooling, they solidify to a stone-like mass. A central canal is left in the explosive charge in which is placed a detonator containing ammonium picrate by which the charge is exploded. This explosive was practically tested in the Boer war and the results were very disappointing. It is, however, still believed to be an efficient explosive for use against armor. The explosive owes its name to the fact that the first experiments made with it were carried on in the environs of the village of Lydd in England.

Charles E. Munroe,
Professor of Chemistry, Columbian University, Washington, D. C.

Lydgate, lĭd'gāt, **John**, English monk and poet: b. Lydgate, Suffolk, about 1370; d. Bury St. Edmunds about 1450. After studying at Oxford, and visiting France and Italy, he entered the monastery of Bury St. Edmunds, and established a school for instructing the sons of the aristocracy in versification and composition. He began to write about 1400. His chief works are his 'The Falls of Princes' (1430); 'Story of Thebes' (1420); and 'Historie, Siege, and Destruction of Troye' (1430). His minor poems were published by the Percy Society in 1840. Ritson, in his 'Bibliographia Poetica,' gives a complete catalogue of his works. Lydgate was an admirer of Chaucer, whom he imitated in 'The Story of Thebes,' a Canterbury Tale in ten-syllabled couplets.

Lydia, lĭd'ĭ-a, Asia Minor, the name of an ancient large and fertile country, inhabited along the coast of the Ionian Sea by the Ionians. Toward the south it was separated from Caria by the Mæander (now Meinder); toward the east it was bounded by Phrygia, and on the north by Mysia. It was in early times a kingdom, divided from Persia by the river Halys (now Kizil Irmak). Its original inhabitants were a people called Mæonians, either of Semitic or of Indo-Pelasgic origin. This race was subdued by the Lydians, a Carian tribe. It attained its highest prosperity under the Mermnadæ dynasty, beginning with the semi-mythological Gyges (716 B.C.), and ending with Crœsus (546 B.C.), who was conquered by the Persians under Cyrus. The people were the richest and perhaps the most effeminate in all Asia. They delighted in luxurious garments, costly carpets, precious ointments, and exquisite viands; and a kind of Grecian music called the Lydian. They also laid out beautiful gardens. Their example corrupted the Ionians. The wealth of the Lydians, however, was probably, in a great measure, confined to the kings and chief men. These could fill their coffers with the gold washed down by the Hermus (now Sarabat) and the Pactolus, and that obtained from the mines; and they procured all the necessaries of life by the labor of their slaves. The Lydians are said to have been the first to coin money, and to establish inns; they are credited with the invention of certain musical instruments, the art of dyeing wool (which was afterward carried to such perfection in Miletus), also the art of melting and working ore. At Sardis, the capital of the country, the Grecians, Phrygians, and even the nomadic tribes bartered their goods. There was here a great market for the slave-trade, which furnished the harems of Persia with eunuchs. The great tumuli graves of the ancient Lydian kings are still to be seen near the Gygæan Lake.

Lye, lī, a solution of an alkali; water impregnated with alkaline salt imbibed from the ashes of wood. It is largely used in soap-making.

Lyell, lī'ĕl, **Sir Charles**, English geologist: b. Kinnordy, near Kirriemuir, Forfarshire, Scotland, 14 Nov. 1797; d. London 22 Feb. 1875. He was educated at Oxford, and on leaving Oxford he began to study for the bar and became a barrister. His life was almost wholly given, however, to geology. His first writings on the subject consisted of contributions to the 'Transactions' of the Geological Society, of which he was secretary 1823–6, and president in 1835–6 and 1849–50, and to which he continued to furnish papers throughout his life. His first important work, and the one on which his fame rests, 'The Principles of Geology,' appeared 1830–3. A portion of it subsequently formed the basis of a separate work, 'The Elements of Geology' (1838). In the prosecution of his geological studies Lyell made four visits to North America, in 1841–2, 1845–6, 1852, and 1853. His 'Travels in North America' (1845), and 'Second Visit to the United States' (1849), although mainly devoted to geological topics, contain many entertaining sketches of political and social life and institutions. On the occasion of his first American visit he lectured before the Lowell Institute in Boston and again 1845–6. In 1863 appeared Lyell's last important and most popular work, 'The Antiquity of Man,' containing a summary of all the facts and arguments that could be obtained from geology, archæology, etc., to prove that man had existed upon the earth at a period vastly more remote than usually believed. In 1864 he was president of the British Association. In 1848 he was knighted, and in 1864 was made a baronet. Lyell was a strong supporter of the "uniformitarian" theory of geology — the steady and long-continued action of forces still at work around us — as opposed to those who believe in great cataclysms or convulsions having taken place in the past. Consult 'Life, Letters and Journals of Sir Charles Lyell' (1881); Geikie, 'The Founders of Geology' (1897).

Lygo'dium. See FERNS AND FERN-ALLIES.

Lyle, līl, **William,** Scottish-American poet: b. Edinburgh, Scotland, 17 Nov. 1822. He emigrated to the United States and settled in Rochester, N. Y. His poems have had a wide circulation in the United States and Canada. Among his most popular Scotch dialect poems is 'The Grave of Three Hundred.' He also wrote several English poems, including 'Diotima.' 'The Martyr Queen' appeared in 1888.

Lyly, lĭlĭ, **John,** English author: b. about 1554; d. London 30 Nov. 1606. He was graduated from Magdalen College, Oxford, studied also at Cambridge, wrote plays for the children's companies of the Chapel Royal and St. Paul's, London, took side with the bishops in the Mar-Prelate controversy and sat in Parliament for Hindon in 1589, for Aylesbury in 1593 and 1601, and for Appleby in 1597. It is, however, for his 'Euphues' (Part I., 'Euphues, the Anatomy of Wit' 1579; Part II., 'Euphues and his England' 1580) that Lyly is best known. This work is a tedious narrative of the fortunes and interests of a young Athenian, and is remarkable for a prose style that exhibits a uniform and continuous affectation of epigram and antithesis. This fashion of writing, styled 'Euphuism,' was much in favor at the court of Elizabeth, influenced numerous writers, and may fairly be assumed to have been ridiculed by Shakespeare. His plays, 'Alexander and Campaspe' (1584), 'Endymion' (1591), and 'Midas' (1592), contain some worthy lyrics.

Lyman, lī'man, **Azel Storrs,** American inventor: b. Potsdam, N. Y., 1815; d. 1885. He was graduated at the Illinois University and had intended to become a Presbyterian clergyman, but deafness prevented the fulfilment of this purpose. Removing to New York he prepared a historical chart subsequently adopted in many schools and colleges, and also contributed to scientific periodicals. His talents for invention having developed themselves he devised important systems of refrigeration, and a new process of ventilation. He also invented a fibre gun for disintegrating wood for paper pulp, which is extensively used, and among his later inventions is the multi-charge cannon known as the Lyman-Haskell gun.

Lyman, Benjamin Smith, American geologist and mining engineer: b. Northampton, Mass., 11 Dec. 1835. He was graduated at Harvard in 1855; taught for several years; in 1859–61 studied at Ecole des Mines, Paris, and then spent a year at the Mining Academy in Freiberg, Germany. In 1858 he became assistant State geologist of Iowa, and in 1870 was employed by the government of India in surveying oil-fields. From 1873 to 1879 he was chief geologist and mining engineer to the Japanese government, and served as assistant State geologist of Pennsylvania, 1877–95. His geological researches have taken him over an unusually wide area of the globe. He has published more than 100 reports and papers on geological subjects, surveying, etc., among which may be mentioned his 'Preliminary Report on the First Season's Work of the Geological Survey of Yesso' (1874); 'A General Report on the Geology of Yesso' (1877); 'A General Report on the Punjaub Oil Lands' (1878); and 'Geological Survey of Japan.'

Lyman, Chester Smith, American astronomer: b. Manchester, Conn., 13 Jan. 1814; d. New Haven 29 Jan. 1890. In youth he was self-taught in astronomy and other branches of science, making for himself serviceable apparatus. He calculated eclipses 15 years ahead and computed almanacs for 1830–1. He was graduated at Yale in 1837, and studied theology there after a previous course at Union Theological Seminary. After a short pastorate (1843–5) at New Britain, Conn., he went to the Sandwich Islands, where he became instructor at the Royal School. Two years later he was surveying in California. In 1850 he returned to the East and resumed his early study of sciences; in 1858 accepted the professorship of industrial mechanics and physics at Yale; from 1871 to 1884 was professor of astronomy and physics in the Sheffield Scientific School, which he had assisted in organizing; and continued to teach astronomy alone until 1889. He made a number of useful scientific inventions, and was a contributor of papers to the 'New Englander' and the 'American Journal of Science.'

Lyman, Joseph Bardwell, American agriculturist: b. Chester, Mass., 6 Oct. 1829; d. Richmond Hill, L. I., 28 Jan. 1872. In 1867 he became agricultural editor of the New York *World,* was editor of 'Hearth and Home' in 1868, and later joined the staff of the *Tribune.* With his wife he wrote 'The Philosophy of Housekeeping' (1867). He published: 'Resources of the Pacific States' (1865); 'Women of the War' (1866); 'Cotton Culture' (1867

Lyman, Phineas, American soldier: b. Durham, Conn., about 1716; d. West Florida, now Mississippi, near Natchez, 10 Sept. 177[illegible]. He was graduated at Yale in 1738, and subsequently practised law in Suffield. In 1755, being commander-in-chief of the Connecticut militia, he served with Sir William Johnson at the battle of Lake George, and, after his commander had been disabled, conducted the engagement to a prosperous conclusion. He was present at the attack upon Ticonderoga by Abercrombie, and at the capture of Crown Point and the surrender of Montreal; and in 1762 commanded the provincial troops in the expedition against Havana. Subsequently he passed many years in England in efforts to procure a grant of land on the Mississippi for the purpose of establishing a colony, and in 1775 embarked with his eldest son and some others for the country in question. [illegible] emigrants who followed him encountered many misfortunes, and after the subjugation of the country by the Spaniards in 1781–2 were obliged to take refuge in Savannah.

Lyman, Theodore, American philanthropist: b. Boston 20 Feb. 1792; d. Brookline, Mass., 18 July 1849. He was graduated from Harvard in 1810, studied at the University of Edinburgh in 1812–14, was for a time aide-de-camp to the governor of Massachusetts, in 1823–7 commanded the Boston brigade of the State militia [illegible] rank of brigadier-general, was a representative in the State legislature in 1821–4 and 1825, State senator in 1824. In 1834–5 he was [illegible] of Boston; and on 21 Oct. 1835, at the risk of his own life, rescued William Lloyd Gar[illegible] from the «gentlemanly mob» that had vow[illegible] bring the Abolitionist to the tar-kettle [illegible] dark. From 1835 he devoted himself to philanthropic work, and in 1844 removed to Brookline, Mass. In 1840-6 he was president of the Boston Farm-school. To this institution he gave $10,000; to the Massachusetts Horticultural Society, of which he was a life-member, $10,000; and to the State reform-school, now the Lyman school, at Westboro, $72,500. He wrote: 'Three Weeks in Paris' (1814); 'The Political State of Italy' (1820); 'The Hartford Convention' (1823); 'The Diplomacy of the United States with Foreign Nations' (1828)

Lyman, Theodore, American naturalist: b. Waltham, Mass., 23 Aug. 1833; d. Nahant, Mass., 9 Sept. 1897. He was a son of Theodore Lyman (1792-1849) (q.v.). He was graduated from Harvard in 1855, from the Lawrence Scientific School in 1858, and was assistant in zoology at the Museum of Comparative Zoology. In 1863-5 was volunteer aide on the staff of General Meade, with rank of lieutenant-colonel. Having been mustered out on 20 April 1865, he was fish commissioner for Massachusetts in 1865-82, and in that capacity made the first experiments undertaken by any State of the Union for the cultivation and protection of food-fishes. In 1883-5 he served in Congress as an Independent representative. He was also president of the Boston Farm-school, a member of the National Academy of Sciences (from 1872), and a trustee of the Peabody education fund. He donated $10,000 to Harvard and his library of scientific works to the Museum of Comparative Zoology. Among his publications are: 'Illustrated Catalogue of the Ophiuridæ and Astrophytidæ in the Museum of Comparative Zoology' (1865), with a 'Supplement' (1871); 'Old and New Ophiuridæ and Astrophytidæ' (1869); 'Papers Relating to the Garrison Mob' (1870); 'Prodrome of the Ophiuridæ and Astrophytidæ of the Challenger Expedition' (1878-9); and 'Report on the Ophiuridæ Dredged by H. M. S. Challenger during the Years 1873-6' (1882).

Lymph, the fluid contained in the lymphatic glands and in the lacteals (q.v.). It is elaborated primarily by the assimilation of food, and is also obtained from the blood and tissues, the system of vessels in which it is contained ramifying throughout the bodies of vertebrates. The clearest and simplest view of the nature and functions of the lymphatic vessels is that which considers them as forming a connecting-link between the digestive and circulatory systems. The matters absorbed from the alimentary canal and from the blood and tissues are converted in the lymphatic glands into lymph, which supplies initial and essential elements of the blood. The lymphatic system, concerned in absorption, is also called the absorbent system. None of the invertebrates have such a defined set of vessels; in the lower animals matters pass from the digestive system into the blood-system directly and without the intervention of any absorbent vessels. The lymphatic vessels constitute a distinctive character of the highest sub-kingdom of animals. Fresh supplies of nutritive matter are poured from the lymphatic system into the current of circulation, but it is difficult, if not impossible, to determine where the function of circulation ends and that of absorption begins.

The lymph as it exists in the lymphatic vessels is a colorless, transparent fluid, odorless, with a slightly saline taste and an alkaline reaction. When microscopically examined, it is seen to be a clear plasma containing corpuscles. It resembles blood in being an alkaline fluid, and in that it coagulates or clots by the separation of the fibrinous part of the plasma; but it differs from blood in that its corpuscles are nearly all colorless, and because its solid matters are present in very small proportions. The lymph-corpuscles, when passed into the current of the blood, by a simple change of medium become the white blood-corpuscles, and, when partially altered they give origin to red corpuscles. The lacteals absorb the chyle directly from the alimentary canal, and pour it, as rudimental blood, into the current of the circulation. Then from the body generally the ordinary lymphatic vessels bring the lymph, which is further elaborated in the lymphatic glands, and pour it into the current of the blood. The actual termination of the lymphatic vessels is in the large veins in the neighborhood of the heart. The lymphatic circulation may thus be regarded as corresponding in its general direction to the course of the venous blood.

The lymphatic vessels resemble small veins in their general structure. They are provided with valves permitting the flow of the lymph only toward the large veins near the heart and into which the lymph is poured. The only structures in which lymphatic vessels do not exist are the non-vascular parts, such as the hair, nails, outer skin, and cartilaginous tissues. The flow of lymph toward the heart is induced partly by the general pressure and action of the muscles of the body, the valvular structure aiding its propulsion as in the veins; and to this, as well as to the absorptive power, must be added the action of the contractile muscular fibres of the lymph-vessels themselves.

The fluid employed in vaccination (q.v.) is also called lymph, of which two varieties are distinguished, human and bovine. The term has likewise been applied to various serums made from bacterial cultures for preventive or curative use in certain diseases, especially to those serums known as antitoxins (q.v.). See Immunity; Koch, Robert; Serum, Therapy; Tuberculosis.

Lymphatic Glands, small organs, round and smooth and comparatively solid, which form part of the lymphatic system in vertebrates. (See Lacteals; Lymph.) Into these, sooner or later in their course, the other lymphatic vessels run, and from them emerge again. The lymphatic glands are highly important structures, since only after passing through them does the lymph contain, in any abundance, lymph-corpuscles. In size the glands may be compared to small almonds, and they are generally arranged in groups. Each gland is entered by a number of afferent vessels which bring lymph to it, while those (efferent vessels) which leave the gland carry lymph away from it. Externally a lymphatic gland presents an envelope of connective tissue, from which the stroma, consisting of a fibrous framework of processes, is prolonged into the interior of the gland. Within the stroma the essential gland-structure is contained. Within the stroma also, as well as within the softer portions or pulp contained in the meshes of the fibrous network, minute blood-vessels are distributed. Corpuscles are added to the lymph in the glands, while in the composition of its fluid it undergoes further elaboration. The lymphatic trunks of the greater part of the body finally pour their contents into the thoracic duct, a small tube which opens into the current of the blood at the point of junction of the internal jugular and subclavian veins of the left side of the body. On the right side of the body is a still smaller duct which receives the contents of the lymphatics of the right half of the chest, the right arm, and right side of the head and neck; and this smaller lymphatic channel or right lymphatic duct opens into the angle formed by the junction of the right jugular and subclavian veins, similarly to its larger neighbor of the left side. The thoracic duct begins in the upper part of the abdomen, and runs up in front of the spine to the root of the neck, where it opens into the great veins. The receptaculum chyli, or cistern of the chyle, is the dilation at the commencement of the thoracic duct in the abdomen, which receives the contents of the lacteals or intestinal lymphatics. The orifices by which the thoracic duct and right lymphatic duct open into their respective great veins are guarded by valves which permit the lymph to flow from the ducts into the veins, but prevent the flow of blood into the ducts.

The spleen has been considered by physiologists to be merely a ductless lymphatic gland of large size, since it appears to be concerned in the elaboration of the blood, and also to be a place of disintegration of the red corpuscles and a manufactory of the white corpuscles of the blood. And the thymus, another ductless gland, has also been supposed to be connected with the function of blood-elaboration, and thus to be associated with the lymphatic system.

Lynch, Anne Charlotte. See BOTTA, ANNE CHARLOTTE.

Lynch, Arthur, Irish journalist and author: b. Smythesdale, Ballarat, Victoria, Australia, 1861. He was educated at Melbourne University and the University of Berlin. practised as an engineer, lectured on engineering and scientific subjects at Melbourne, was for a time a journalist in London, was a war correspondent in Ashanti, and twice visited America. During the second Boer war he was colonel in the Irish brigade No. 2 of the Transvaal forces; and upon his landing in Great Britain subsequent to the war was brought to trial for high treason. He was sentenced to death; but this sentence was afterward commuted to life imprisonment. Lynch was elected M. P. for Galway in 1901. Among his books are: 'Modern Authors' (1891); 'Approaches' (1892); 'Our Poets' (1895); 'Religio Athletæ' (1895); 'Human Documents' (1896).

Lynch, Charles, American planter and soldier: b. 1736; d. 1796. He lived on the Staunton River in Virginia, and in support of the revolutionary government in that region during the early part of the war with Great Britain, joined Robert Adams and Thomas Calloway in the punishment and exile of Tories. A frequent method, so says tradition, was to suspend the disaffected by their thumbs until they were willing to exclaim "Liberty forever!" The summary acts of this self-appointed court are generally accepted as the origin of the term lynch-law (from "Lynch's Law"). But whereas the expression is now used almost exclusively of punishment by death without legal authorit
appear that Lynch ever exacted t
alty.

Lynch, George, English autl
nalist: b. Cork, Ireland, 27 Ma
went on exploring expeditions in
tralia and in the Pacific islands; i
war correspondent for the Londor
icle in the Spanish-American V
went to Africa as correspondent
trated London News' during t
and was wounded at the battle
He was at Ladysmith during th
the siege, and, on attempting to
to join General Buller's forces, w
the Boers and kept a prisoner
Shortly after obtaining his freedc
to England. He was war corres
Daily Express and the *Sphere* in
paign for the relief of Peking, a
southern China and Japan. He
special correspondent for the Lon
in the United States. He has
War of the Civilisations'; 'Reali
Bare Truth about War and Oth

Lynch, Hannah, English nc
uary 1904. She was the Paris c
'The Academy' and published
Glades'; 'George Meredith: a
Vermont's Fantasy'; An Odc
'Toledo' in 'Mediæval Towns'
Life in Town and Country';
of a Child'; etc. She also transl
of Echegaray (q.v.) into Englisl

Lynch, John Joseph, Ca
Catholic prelate: b. Ireland 181
cated at Dublin and Paris, and
priesthood in 1843. Three yea
to the United States, was first
sionary work at Houston, Tex
came president of the Lazarist
Mary the Barren in Missouri.
Canada, where he founded the
Lady of Angels, and in 186
bishop of Toronto. He was
bishop of Toronto and Metropc
in 1869 he was a member of th
cil.

Lynch, Patricio, Chilean
tary officer: b. Santiago Chile
May 1886. He was educated
Naval Academy; entered the
1840 and took part in the An
in 1847 he re-entered the C
served during the war against
he commanded a military and
against Peru, and ravaged the
that state, destroying a large
erty. He also took part in t
Lima, and was made comman
Chilean army; in the city of L
served martial law, suppres
government, and took Calderc
president, prisoner, though th
a protest from the United S
1883 he evacuated the city, h
sias at the head of affairs. H
admiral of the navy, and in 18
to Spain. He died on his hon
years later.

Lynch, Thomas, Jr.,
one of the signers of the D
pendence: b. Prince George'

Aug. 1749; perished at sea in the latter part of 1779. He was educated at Eton and the university of Cambridge, and was subsequently admitted a student in the Temple, London. In 1772 he returned to South Carolina, and at the outbreak of hostilities in 1775 was appointed a captain in the first regiment of provincial regulars raised by South Carolina. Being unanimously chosen by the provincial assembly to succeed his father as a member of Congress, he took his seat in that body in 1776, but in a few months was compelled by ill health to retire from active political life. One of his last public acts was to affix his signature to the Declaration of Independence. In the latter part of 1779, as the only means of saving his life, he sailed for St. Eustatius, West Indies, intending to find there a neutral vessel which would convey him to France. The ship in which he sailed was never heard from and is supposed to have been lost in a storm.

Lynch Law, or Judge Lynch, a name for irregular punishment, especially capital, inflicted by private individuals independently of the legal authorities. The origin of the term is doubtful; by some it is said to be from James Lynch Fitz-Stephen, warden of Galway, Ireland, who, about 1526, sentenced his son to death for murder, and to prevent a rescue by a mob, executed him with his own hands without due process of law. By others the term is said to have had its origin in the State of Virginia, where a farmer of the name of Charles Lynch (q.v.) took his own way of obtaining redress for a theft by catching the culprit, tying him to a tree, and flogging him. This mode of administering justice has always prevailed more or less in every country in times of great popular excitement, and is necessarily resorted to in newly settled territories, where the power of the civil government is not fully established. As early as 1768, in the United States the terms «regulating,» «regulation,» and «regulator» were in use in the Carolinas; illegal whippings were at that time inflicted by the Regulators, and it is claimed that a meeting of the Regulators took place at Lynch's Creek. Whether there is any historical connection between the Regulators of the Carolinas and the Regulators who flourished along the western frontiers where lynch law was well known, in and after 1819, is one of the many obscure points in the early history of lynch law which await elucidation. At first in the United States, «lynch law» was not mob law, as it is now understood. It was orderly, methodical, and fair in its practices, and was strongly opposed to violence or mob rule. Its distinctive feature was simply that its decrees and findings were executed sternly and swiftly on the spot where they had been decided upon. This was true of the conditions in California in 1849 when Judge Lynch held frequent court, and hundreds of culprits were executed between 1849 and 1860, in an orderly manner, with nothing of the mob violence or excitement common in recent years. During the Civil War and afterward, lynching was practised in the Southern States at the instigation of the Ku Klux Klan (q.v.). From 1870 it became an unwritten law in the South to lynch by mob rule every negro charged with rape or assault, or with the murder of a white person. Gradually this practice spread to Northern States, and negroes were not only «lynched,» or hung, but were burned at the stake in Indiana, Illinois, Ohio, and other States. In 1892, there were 241 lynchings in the United States, and of this number 162 were negroes. During 1902 there were 100 lynchings in this country. Rarely is there conviction or punishment of persons who participate in lynchings, owing largely to the sympathy of jurors for the accused. In Kansas and Indiana laws have been passed providing for the suspension from office of sheriffs who fail to protect prisoners from the violence of the mob. The best remedy for lynch law is prompt action by the courts and the prompt execution of sentence after a culprit has been convicted.

Lynchburg, Va., city, Campbell County; on the James River, and on the Norfolk & W., the Southern, and the Chesapeake & O. R.R.'s; about 125 miles west by south of Richmond. The city is situated in a river valley which forms a pass through the mountains. The irregularity of the surface upon which stands the city, the hills, the numerous terraces, the many trees along the streets, the well-built, handsome houses with neatly kept grounds, all make the place most attractive.

History.— Lynchburg was founded in 1786 by John Lynch, but it was not incorporated until 1823. It was early in the 19th century, as now, a distributing centre for places above on the river. and for many settlements and towns south of the James. The Confederates used it as a supply depot during the Civil War. On 18 June 1864 Gen. Hunter, of the Federal army, attacked the city, but was defeated.

Manufactures, etc.— The chief manufactures are iron and brass products, tobacco, cotton goods, plows, wagons, shoes, dyes, bark extract, hardware, flour, and lumber. It has extensive tobacco interests, as a manufacturing and jobbing centre being among the seven leading shoe jobbing centres of the Union. The trade is principally in tobacco, raw and manufactured; coal, granite, and its own manufactures. Lynchburg is the seat of Randolph-Macon Woman's College, and it has four hospitals, and the Miller Female Orphan Asylum. Granite quarries are near by, and large coal fields and iron ore are in the neighboring counties. The river furnishes extensive water-power, which aids in the development of the manufacturing interests of the city.

Government, etc.— The government of the city is vested in a mayor, who holds office two years, and a council. The city treasurer, clerk of the courts, and commissioner of revenue are chosen by popular election, and the other officers are appointed. The waterworks plant is owned and operated by the city. Pop. (1900) 18,891; (1904 est.) 25,368. Consult Cabell, ‹Sketches and Recollections of Lynchburg.›

John A. Faulkner,
Secretary Lynchburg Board of Trade.

Lynde, Francis, American novelist: b. Lewiston, N. Y., 12 Nov. 1856. After many years in the railway service in various capacities, he turned to literature in 1893 and besides contributions to magazines, has published: ‹The Helpers: a novel of Colorado Life› (1899); ‹A Private Chivalry› (1900).

Lyndhurst, lĭnd'hėrst, **John Singleton Copley,** Baron, English lawyer and statesman: b.

Boston 21 May 1772; d. London 12 Oct. 1863. His father (q.v.) was the well-known painter of the same name. He was taken to England in early infancy, his parents having gone to reside in London. He was educated at the University of Cambridge, became a fellow of Trinity College, traveled in the United States, was called to the bar at Lincoln's Inn in 1804, and soon gained a high position. In 1817 he ably defended Watson and Thistlewood for high treason, and obtained their acquittal. In 1818 he entered Parliament for Yarmouth, Isle of Wight, which he soon exchanged for Ashburton. In 1819 he became solicitor-general and was knighted. He conducted the prosecution in the trial of Queen Caroline. In 1824 he succeeded to the post of attorney-general, in 1826 was elected for Cambridge, and became master of the rolls. He succeeded Lord Eldon as chancellor in 1827, which post he retained until 1830, and was raised to the peerage as Baron Lyndhurst. In March 1829, he delivered a great speech against Catholic emancipation. During the ministry of Earl Grey (1830–4) he was chief baron of the exchequer. He was a formidable opponent of the reform bill, and in 1834 became a second time chancellor, but in 1835 retired with the Peel ministry. Lyndhurst's speeches and annual reviews of the session contributed greatly to the return to power of the Conservatives in 1841. on which occasion he was a third time raised to the woolsack. He retired in 1846, from which time he took little part in home politics, confining his attention more to matters of foreign policy. For a long time he was virtually the Tory leader in the upper house. Brougham said: «Lyndhurst was so immeasurably superior to his contemporaries . . . that he might well be pardoned for looking down rather than praising.» Consult: Sir Theodore Martin's ‹Life› (1883).

Lyne, lĭn, **Joseph Leycester**, commonly known as «Father Ignatius,» or «Ignatius of Jesus.» English clergyman and author: b. London, England, 23 Nov. 1837. After taking deacon's orders, and doing some mission work in London, he conceived the idea of reviving the Benedictine rule in a modern monastic foundation. With this view he built Llanthony Abbey in Wales, where he was joined by a few enthusiasts, though his movement has made no progress at all commensurate with his programme. He is a striking preacher and has visited the United States as a missioner. Among his published works are: ‹The Catholic Church of England› (1864); ‹Brother Placidus› (1870); ‹Leonard Morris, or the Benedictine Monk› (1871); ‹Mission Sermons and Orations› (1886); ‹Tales of the Monastery.›

Lynn, lĭn, Mass., city, in Essex County; on Massachusetts Bay, and on the Boston & M., the Boston, Revere Beach & L. R.R.'s; about 10 miles northeast of Boston, and five miles southwest of Salem. Area, nearly 12 square miles. Lynn was first settled in 1629 by Edmund and Francis Ingalls and for a time was called Saugus. It was incorporated in 1630 and chartered as a city in 1850. The city includes what were several independent villages: Glenmere, Highlands, East Lynn, West Lynn, Linwood, Lynmere, and Wyoma. The Lynn harbor is shallow, but it is considered safe. The three-mile shore-line adds to its attractions. The city is noted for its shoe factories. The annual amount of shoe business is $40,000,000; and the number of persons employed, 25,000. The General Electric Company's annual business amounts to over $40,000,000, and the number of employees is about 20,000, over 6,000 of whom are in Lynn. The chief manufactures are shoes, cut leather, shoe machinery, electrical supplies, meters, arc lamps, morocco, and patent medicines. There are 11 banks, six national, three savings banks, and two trust company banks. The combined capital is $1,600,000. The total deposits in the savings banks amount to $10,000,000; total in the national and trust company banks, $6,000,000. The city has the following churches: Methodist, 12; Baptist, 7; Congregationalist, 7; Roman Catholic, 4; Protestant Episcopal, 2; Universalist, 2; Friends, 2; Presbyterian, Adventist, Wesley Evangelical, Pentecostal, Swedish, Lutheran, and Hebrew, each one church.

Some of the principal buildings are Lynn Public Library, which has about 65,000 volumes; Lynn Hospital, the city hall, Lynn Home for Aged Women, and an orphanage. There are two high schools, 101 grammar schools, 120 primary schools, four large parish schools, containing primary, grammar and high school departments.

The annual expenditure for municipal maintenance and operation is about $1,348,000; the chief items are, schools, about $245,000; for poor, sick, homeless, and other charities, $106,000; for police department, $84,500; for fire department, $96,000; for waterworks, $64,500; for city lighting, $56,000. The waterworks plant opened in 1870, and costing about $2,500,000, is owned and operated by the city.

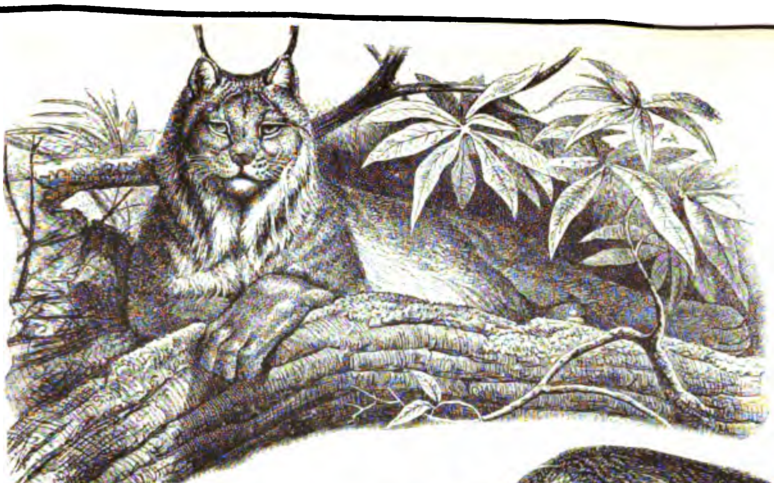
The government is vested in a mayor, a board of aldermen (11 members), and a common council of 25 members, who are elected annually. The large majority of the people were born in the United States. Pop. (1890) 55,727; (1900) 68,513. Consult: Newhall, ‹History of Lynn, Mass.›

W. R. Hastings.

Lynx, a wildcat, distinguished from the larger members of the family *Felidæ* chiefly by the shortness of the tail, and the presence of a pencil-like arrangement of hairs at the tips of the ears. It was long customary to regard these cats as constituting a separate genus *Lynx*, to which the North American wildcats, the caracal, and some others, were assigned, but modern zoologists include them with the general genus *Felis*. See Wildcat. The fur known to trade as «lynx» is furnished by the Canadian lynx. and is described as of a light-brown color, with a light silvery top on the back, that on the under part long, soft, and spotted; about 30,000 to 80,000 are exported yearly from the Dominion of Canada, California, and Alaska to Liverpool, besides what is consumed in domestic trade.

Lyon, lī'ŏn, **David Gordon**, American Assyriologist: b. Benton, Ala., 24 May 1852. He was graduated from Howard College, Ala., and from the University of Leipsic in 1882, and since the latter date has been Hollis professor of divinity at Harvard. He was recording secretary of the American Oriental Society, 1886–95, and corresponding secretary of the Society of Biblical Literature, 1894–9. He has published ‹Keilschrifttexte Sargons, König von

LYNXES.



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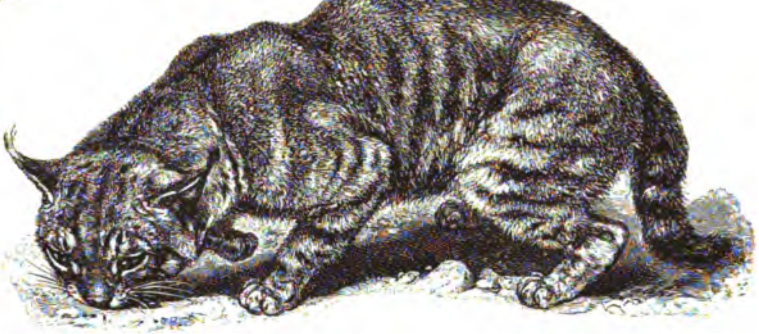

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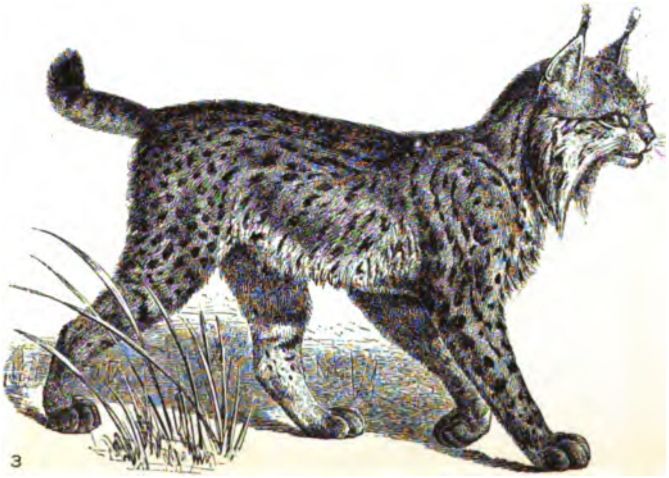

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1. Canada Lynx. 2. European Lynx. 3. Chaus.

Assyrien' (1883); 'An Assyrian Manual' (1886).

Lyon, Mary, American educator: b. Buckland, Mass., 28 Feb. 1797; d. South Hadley, Mass., 5 March 1849. She began teaching at 18, and later studied at the Sanderson Academy, Ashfield, and at the Byfield Academy, near Newburyport, continuing to teach at intervals. In 1821 she began teaching at the Sanderson Academy, and in 1824 became associate principal of the Adams Female Academy at Londonderry, N. H. In 1828, with the principal of this school, she moved to Ipswich, Mass., where they were followed by a number of their pupils, and established a seminary of which Miss Lyon had practically the entire charge for several years. The establishment of a seminary for girls, embodying the same principles of education as the Ipswich school, and at the same time offering its advantages at a low price, became the main purpose of her life; and in 1834 she resigned her position at Ipswich, and, amid great discouragements, undertook the work of founding such a seminary. Aided to some extent by clergymen and others, she succeeded in obtaining contributions, and on 8 Nov. 1837 a part of the buildings having been completed, the school was opened in South Hadley with about 80 pupils, under the name of the Mount Holyoke Female Seminary. She was president of this school for 12 years, during which time it was enlarged, and gained a national reputation for its high intellectual and moral standard. (See MOUNT HOLYOKE COLLEGE.) She wrote 'Tendencies of the Principles embraced and the System adopted in the Mount Holyoke Female Seminary' (1840), and the 'Missionary Offering' (1843). Consult: Hitchcock, 'Life and Labors of Mary Lyon.'

Lyon, Matthew, American politician: b. Wicklow County, Ireland, 1746; d. Spadra Bluff, Ark., 1 Aug. 1822. He went to New York in 1755, and, being too poor to pay for his passage, was bound out by the captain of the ship to a farmer in Connecticut, in whose service he remained a number of years. Subsequently he became a citizen of Vermont, and in July 1776 was commissioned as lieutenant in one of the companies of "Green Mountain boys." He served later as commissary-general, and eventually rose to the rank of colonel of militia. He was one of the founders of Fairhaven (1783), where he engaged in paper-making, iron casting, and other occupations, and at one time edited a newspaper of an ultra democratic character, entitled 'The Scourge of Aristocracy and Repository of Important Political Truth,' of which the types and paper were manufactured by himself. Becoming an active political leader, he was elected in 1797 to Congress by the Anti-Federal Party. In October 1798 he was convicted of a libel on President Adams, and imprisoned for four months, a fine of $1,000 which had also been imposed upon him being paid by his friends. An attempt to expel him from Congress as a convicted felon failed for want of a two thirds vote. During this congressional term he had a violent altercation on the floor of the House with Mr. Griswold of Connecticut, ending in blows; but the motion to expel them was defeated. In 1799, while a prisoner, he was re-elected to Congress from Vermont. After the expiration of his term he removed to Kentucky, where at the next Congressional election (1803) he was returned to the House, of which he continued a member until 1811. Subsequently he held the office of United States factor for the Cherokee Indians by the appointment of President Monroe, and removed to Arkansas, of which he was the territorial delegate-elect to Congress at the time of his death. Though rough and impetuous in manner, he was an able debater, and to the end of his life continued a man of active business habits.

Lyon, Nathaniel, American soldier: b. Ashford, Conn., 14 July 1818; d. Wilson's Creek, Mo., 7 Aug. 1861. He was graduated from West Point in 1841; served in the Mexican War, 1846–7, being present at the siege of Vera Cruz, and the assault on the City of Mexico; and was on duty in Kansas during the Free State agitation. In February 1861 he was assigned to St. Louis, Mo., where he had charge of the arsenal; he was most active and efficient in the Union cause, organized the Home Guard, and on 10 June 1861 captured Camp Jackson, a rendezvous of the secessionists. Soon afterward he was made brigadier-general of volunteers, and given command of the department. He refused all compromise with Governor Jackson, who sympathized with the secessionists, and in June occupied Jefferson City, the capital of the State, and defeated the Governor's troops at Boonville on the 17th. He then went to Springfield, whence he advanced on 1 August to meet a part of the Confederate army, which was advancing into Missouri under McCulloch; he defeated them at Dug Spring, and returned to Springfield. But the Confederate forces were soon increased by the arrival of the troops under Price, and General Lyon was opposed by an army considerably greater than his own. Unwilling to surrender southwestern Missouri without a struggle, he decided to risk a battle, and accordingly advanced from Springfield to Wilson's Creek, where his troops were defeated, and he himself killed, after a gallant fight. He bequeathed nearly all his property, about $30,000, to the government to aid in the preservation of the Union. In 1862 a collection of his letters in favor of the Republican party and the election of Lincoln (1860) was published under the title 'The Last Political Writings of General Nathaniel Lyon.' Consult 'Life' by Woodward; Peckham, 'General Nathaniel Lyon and Missouri in 1861'; and Churchill's novel, 'The Crisis.'

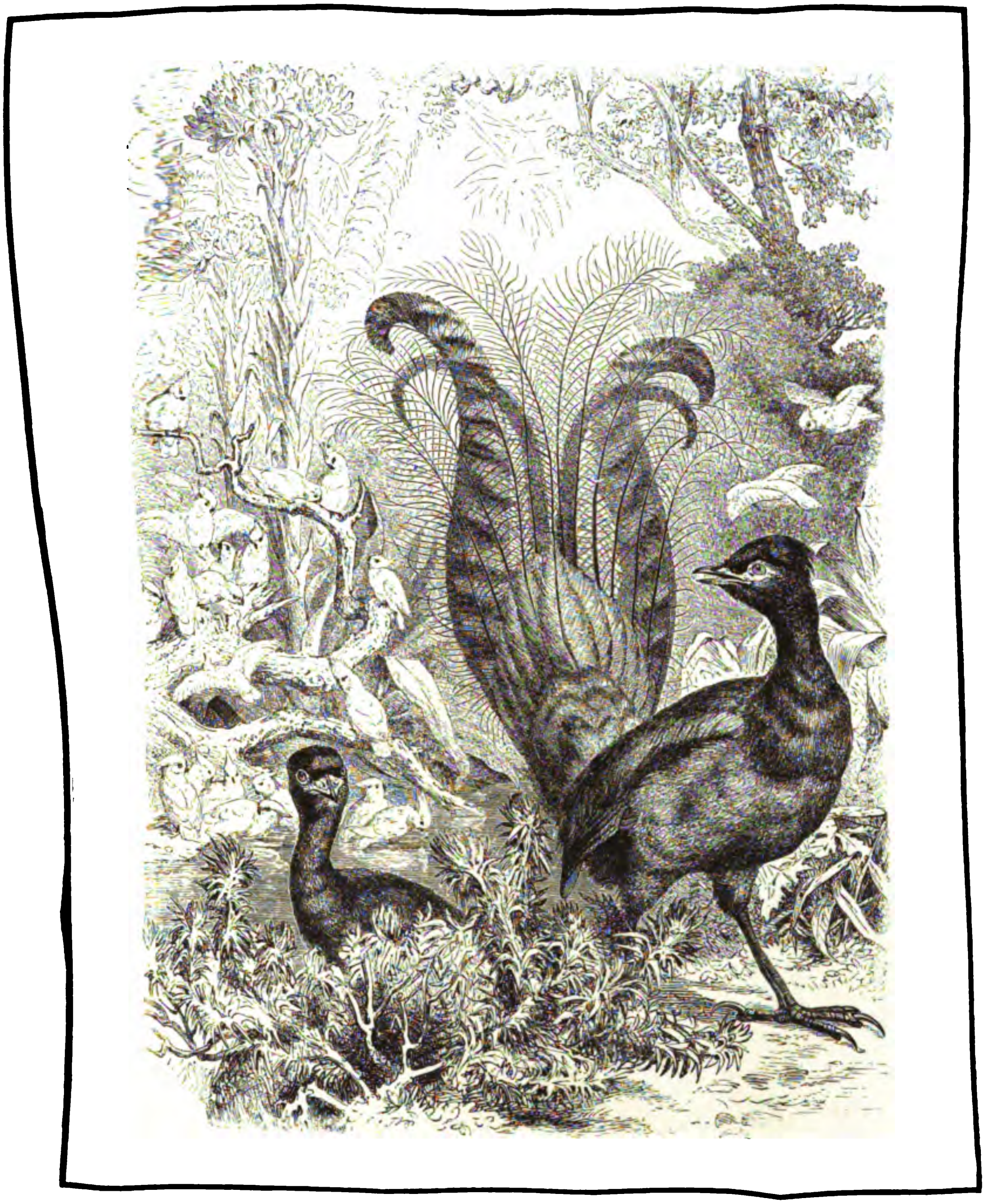
Lyons, lī'ŏnz, or **Lyon,** lē-ôṅ, France, the capital of the department of the Rhône, 311 miles by rail southeast of Paris, and 170 miles north of Marseilles, is the second city of industrial importance, and the third in point of population in the country. It is situated at the confluence of the Saône and Rhône, the central business section being on the tongue of land that projects between the rivers to their junction, and extends northward to the hill of La Croix Rousse; while the ancient mediæval town is on the steep slopes of the Fourvières hill, rising from the west bank of the Saône, and the modern industrial suburb of La Guillotière, with its numerous factories, is on the east bank of the Rhône. Thirteen bridges span the Saône at this point, varying from 250 to 450 feet wide, and nine bridges the Rhône, over 600 feet wide. A series of detached forts crown different heights within a circuit of

43 miles, making Lyons, with its extensive barracks and considerable garrison, a defensive position of great strategic importance. The older quarters of the town are crowded, dirty and unhealthful, with narrow, irregular streets, lined by tall, ungainly buildings. The best parts are the 13 miles of magnificent quays, built since the 18th century as a protection against the periodical river floods, and now laid out with finely planted walks, stately mansions, municipal buildings, railroad depots, capacious warehouses, etc. Among the notable squares and open places are the Place des Terreaux, facing which stands the Hôtel de Ville, and the large and handsome Place Bellecour, the fashionable promenade. The chief public edifices are more remarkable for their antiquity than for the beauty of their architecture. The cathedral of St. John on the slope of the Fourvières, on the right bank of the Saône, is in the Gothic style of the 12th century, and has four towers, two of which flank the west front, while the other two, shorter but more massive, form the transepts. Higher up the slope is the modern church of Notre Dame, an imposing composite edifice occupying the site of the *Forum Vetus* built by Trajan. Beside it is a tower or Belvedere 680 feet above the Saône. On the other side of the Fourvières is the church of St. Irenæus, the second bishop of Lyons. The church itself is an uninteresting modern structure, but it stands on the grave of the martyred bishop, and has beneath it the reputed crypt in which Polycarp preached, and 19,000 Christians at a later period were massacred by orders of Septimius Severus, 202 A.D. A little above the cathedral is the Palais de Justice, and lower down on the opposite bank of the Saône is the church of the Abbey of Ainay, beneath whose sacristy, and penetrating below the bed of the river, are dungeons without light or air, in which many of the early Christians were immured previous to martyrdom. Other noteworthy churches are the Church of St. Nizier, of the 14th century, one of the largest in the town; that of St. Bonaventure, the patron saint of Lyons; and the Church of the Chartreux, surmounted by a superb dome seen from all quarters of the city. The archiepiscopal palace, situated near the cathedral, is a large edifice of no architectural merit. The Hôtel de Ville is considered one of the finest edifices of the kind in France. It is an isolated square, and is surmounted by a dome 164 feet high. The public library, occupying part of the buildings of the college on the Quai de Retz, is the best provincial collection in France. The Palais des Arts, facing the Place des Terreaux, is a fine majestic edifice. It contains a picture-gallery, a cabinet of medals, a gallery for statues, and another for ancient stuccoes, a depot of mechanical inventions for the fabrication of silks, with a library attached; a free school of design, and a large hall used as the exchange.

The chief educational establishments are the college, or university, occupying a fine modern building and attended by over 2,000 students in the different faculties; the Martinière, a great school of science and the industrial arts with 500 students; a free Catholic university; various institutions of a special character, such as schools of chemistry and chemical industry, schools of design, of commerce, of weaving; a celebrated veterinary school, the botanic garden, etc. Charitable establishments are large and numerous. The most important are the Hôtel-Dieu, the Maison de la Charité, the Mont de Piété, occupying the Manécanterie or deanery attached to the cathedral; and the Hospice de l'Antiquaille, on the site of the ancient Roman palace or prætorium, now used partly as a lunatic and partly as a Magdalen asylum, and general penitentiary. There are several prisons — the New Prison, an extensive building, well arranged; the Maison des Recluses, now employed as a military prison; and the prison of Roanne, regarded as a model in its kind.

As a manufacturing town Lyons early acquired and has long maintained a first place. It is the most important centre of silk manufacture in the world, employing directly and indirectly over 200,000 persons. Other manufactures are hats, boots, jewelry, and liqueurs; besides dye-works, foundries, glass-houses, potteries, tanneries, breweries, and chemical works. Lyons is admirably situated for trade, on two navigable rivers, which make it a great entrepot both for the north and the south. It forms the common centre where the highways and railroads from Paris, Marseilles, Bordeaux, from Switzerland, and Italy, all meet; it communicates with the Rhine by the Rhône and Rhine Canal, while several other canals, branching off from its rivers, give it ample means of transport over a great part of the interior of the country. The chief imports are raw silk, wine, brandy, oil, soap, flax, hemp, rice, salt, cotton, wool, coffee, dyes, earthenware, and timber; and the exports, spun-silk and silk-goods ribbons, hats, straw-bonnets, woolens, flannels, linens, corn, flour, chestnuts, liqueurs, paper, hemp, ironware, etc.

As Lugdunum, Lyons was an early Gallic town, and when Cæsar invaded Gaul was a place of some importance; it figures more or less in the subsequent history of the Roman Empire, several emperors in succession making it their occasional residence and vying with each other in adorning it. It early received Christianity, and toward the end of the 2d century numbered thousands of Christians among its inhabitants. Its first bishop, Pothinus, died a martyr in 197, and his successor Irenæus died also a martyr in 202. Lyons was afterward sacked by the Huns and Visigoths, who destroyed many of its noblest Roman structures. In the 8th century it fell for a time into the hands of an army of Saracens from Spain, and suffered severely; but recovered its prosperity under Charlemagne, on the dissolution of whose empire it became the capital of the kingdom of Provence. Subsequently it fell under ecclesiastical domination, and was long governed by a succession of archbishops. In 1312 Lyons was annexed to the crown of France. It owes its new quays and several of its finest edifices to Louis XIV. The revolution of 1793 occasioned fearful reverses. The inhabitants, finding their industry paralyzed and their trade destroyed, rebelled against revolutionary violence, and the convention let loose its forces upon them; wholesale butcheries for many days deluged the town with blood. Since that period questions of an economical, or rather socialist nature, culminated in the sanguinary revolts of 1831, 1834, 1849 and 1871. Several important figures in history were natives of Lyons, among them the Roman emperors Marcus Aurelius, Claudius, and Caracalla, and the celebrated general Germanicus. Pop. (1901) 459,099.



LYRE BIRD.

Lyons, Iowa, formerly an independent city in Clinton County, but incorporated with the city of Clinton in 1895. See CLINTON.

Lyons, Kan., city, county-seat of Rice County; on the Atchison, T. & S. Fe, the Missouri P., the St. Louis & S. F. R.R.'s; about 180 miles west by south of Topeka and 25 miles north by west of Hutchinson. It is situated in a fertile agricultural region in which stock-raising is a prominent industry. Nearby are salt deposits, like that at Hutchinson in Reno County, a remarkably fine salt, obtained from a considerable depth below the surface. Some of its industrial establishments are salt works, grain elevators, gas-engine works, and flour-mills. Its trade is chiefly in grain, salt, live-stock, flour, and corn. The city owns and operates the waterworks. Pop. (1900) 1,736.

Lyons, N. Y., village, county-seat of Wayne County; on the Erie Canal, and on the West Shore and the New York C. & H. R. R.R.'s; about 40 miles east by south of Rochester. Lyons was founded in 1795 and incorporated as a village in 1854. It is situated in a fertile agricultural region, and its extensive water power has contributed to its development as a manufacturing village. Its chief manufacturing establishments are a beet-sugar factory, barrel factory, distilleries of peppermint oil, a pottery, and machine-shops. Slipper-soles and silverware are also manufactured. The Union School Library has about 4,000 volumes. Pop. (1900) 4,300.

Lyons, Councils of, two synods held at the city in France from which they derive their name and considered ecumenical by the Roman Catholic Church. When the quarrel between the Emperor Frederick II. and Innocent IV. had resulted in the banishment of the latter from Rome, the pope summoned a council in 1245 at which the patriarchs of Aquileia, Antioch and Constantinople, as well as the Emperor Baldwin II., were present with several royal delegates. Thaddæus of Susa represented Baldwin, who was, in spite of that delegate's emphatic protests, solemnly deposed, and his subjects released from their allegiance. When Gregory X. took the tiara, his first step was to attempt a reunion of Christendom, as represented by the Greek and Latin churches, which had been parted by schism mainly on the question of the *filioque* (q.v.), and Latin accretions to the doctrine of purgatory. The second Council of Lyons met 1274 under his presidency and the desired union was apparently effected; for both Greek and Latin prelates sang the creed including the clause asserting the double procession. The tie that bound them, however, proved a rope of sand, and the schism has continued to this day. See GREEK CHURCH.

Lyons, Gulf of. See LION OR LYONS, GULF OF.

Lyre, the most ancient of stringed instruments, which originally had but three strings. The Egyptian and Grecian lyres were at first strung with the sinews of animals. The number of the strings was at last increased to sixteen. It was played with a stick of ivory or polished wood, also with the fingers. The body of the lyre was hollow, to increase the sound. Few objects are so graceful in form and susceptible of such various application in the fine arts. As a musical instrument it has now gone out of use among the civilized nations, though a rude form of it is still to be met with in the hands of the shepherds of Greece and among the negro tribes of Africa. It is the symbol of Apollo.

Lyre-bird, a remarkable Australian bird which derives its name from the form of the tail in the male, which much resembles that of the conventional Apollo's lyre; the tail of the female is rather long, but simply wedge-shaped. There are two species, about the size of chickens, both reddish brown and called «native pheasants» by the colonists, constituting the genus *Menura* and family *Menuridæ*, and regarded as the lowliest of the *Passeres,* and of very ancient origin. They dwell in the «scrub» or open woods, and rarely leave the ground, avoiding their enemies by swift running. Their nests are placed upon the ground, are well woven of sticks and plant-stems, and are covered by a dome-like roof, leaving an entrance only at the sides. In the mating season the males scrape up mounds of leaves and rubbish upon which they strut about, sing and do their best to display their long and handsome tails to the hens. The better known species is the long-tailed one (*M. superba*), but both are now rare.

Lyr'ic Poetry, that species of poetry by which the poet directly expresses his emotions. The predominance of feeling in lyric poetry is what chiefly distinguishes it from dramatic poetry, in which action and character, independent of the individual emotion of the poet, predominate; and from epic poetry, of which a series of actions and characters, as contemplated and exhibited by the poet, is the characteristic. It is necessary that the feeling represented should be itself poetical, and not only worthy to be preserved, but accompanied by a variety of ideas, beauty of imagery, and an eloquent flow of language. Milton, Chatterton and Burns are among the better known English writers of lyric poetry.

Lys, lēs, or **Leye,** lī-ĕ, Belgium, an affluent of the Scheldt, which rises near Lysbourg, Pas-de-Calais, France, and after a northeasterly course of 130 miles, unites with the Scheldt at Ghent, Belgium.

Lysander, lī-săn'dẽr, Spartan general: d. 395. His father was Aristocritus, a Lacedæmonian of the purest blood, being of Heracleidan descent, his mother a Helot who brought him up in poverty. His fine qualities, however, procured him the command of the Spartan fleet off the coasts of Asia Minor (408). He established his headquarters at Ephesus, which he raised to prosperity. Next year he was succeeded by Callicratidas. In a short time his reputation had so increased that the Asiatic allies of Sparta requested the Lacedæmonians to invest him a second time with the command. Accordingly, Lysander with the title of vice-admiral (405 B.C.), defeated and captured the Athenian fleet off Ægospotamos. This decisive victory put an end to the Peloponnesian war. Shortly afterward he set sail for Athens, which he blockaded. The city was starved into capitulation (404), the long walls and the fortifications of the Piræus were demolished; and the oligarchy of the Thirty Tyrants was established, which governed with terrible cruelty. Lysander then returned to Lacedæmon, where his ambitious and unscrupulous character made itself more palpable than ever. He was excessively fond of praise, and was the first of their own countrymen to whom the Greeks erected altars, offered sacrifices as to a god, and celebrated festivals. On his return to Sparta Lysander, stung by the ingratitude of Agesilaus, whose succession to the throne he had secured, resolved to destroy the constitution of his country by abolishing hereditary monarchy, making the throne elective, but the Delphic and other oracles were unfavorable, in spite even of his bribes. On the outbreak of the Bœotian war (395 B.C.) he marched against Haliartus and was killed in battle under its walls.

Lysias, lĭs'ĭ-ạs, Athenian orator: b. about 458 B.C.; d. about 380. He was a son of Cephalus, an orator, of whom Plato makes honorable mention in his ‘Republic.’ Lysias, at 14 went to Thurium, in Magna Græcia, to study philosophy and eloquence under Tisias and Nicias of Syracuse. Having settled in Thurium, he was employed in the government; but on the defeat of the Athenians in Sicily was banished with many of his countrymen. After Athens had recovered its freedom he exerted himself for the advantage of the city, and sacrificed much of his property for the public welfare. At first he gave instruction in eloquence; but finding himself surpassed by Theodorus, another teacher of oratory, he devoted his time to writing orations for others. He wrote more than 200, some say 400 orations, but only 223, however, were regarded as genuine. His style is applauded as a perfect example of the simple Attic eloquence. Only 34 of his orations have come down to our times. They have been published in various collections of the Attic orators; among the best separate editions of them are those by Baiter and Sauppe (1850); Cobet (1863); Thalheim (1901). See Jebb, ‘Attic Orators,’ Vol. I. (1880).

Lysicrates, lī-sĭk'rạ-tēz, **Monument of,** located in Athens; one of the earliest examples of Corinthian architecture. It was dedicated 334 B.C. to Dionysus, by Lysicrates, as a trophy for winning the Dionysian games. The monument, which was built in the form of a round temple was surmounted by a bronze tripod and stood on a cubical base 13 feet high. The building on account of its shape was popularly known as the “Lantern of Demosthenes.”

Lysima'chia. See LOOSESTRIFE.

Lysimachus, lī-sĭm'ạ-kŭs, general and one of the diadochoi of Alexander the Great: b. Pella, Thessaly, 361 B.C.; d. near Corus 281 B.C. He was a low born Macedonian of great physical strength and courage. On the death of Alexander, 323 B.C., Thrace fell to the share of Lysimachus, who became also satrap of Macedonia in 286. The murder of his son Agathocles, a great favorite of the people, at the instigation of his Egyptian wife Arsinoe, provoked a revolt in Asia; Seleucus, satrap of Syria, took up the cause of the widow of Agathocles, Lysandra, and Lysimachus was killed in the battle near Corus which ensued. He founded a city on the Hellespont, named after him Lysimachi.

Lysippus, lī-sĭp'ŭs, Greek sculptor who flourished in Sicyon between 360 and 316 B.C. Alexander the Great would permit no one but Apelles to paint his portrait, and no one but Lysippus to make his statue. Lysippus was first a smith, and afterward devoted himself to sculpture, adopting the canon of Polycletes, as exemplified in that artist's ‘Doryphorus.’ This canon, or standard of beauty, presents the human form with the head smaller, and the limbs longer and slenderer than in life. His statues were wrought with much greater ideal beauty than those of his predecessors. They were almost all, if not all, in bronze, and he is said to have left behind him some 1,500 works. Several of his more celebrated statues were those of Alexander, the most noted of which represented the Macedonian hero bearing a lance. This was considered as a sort of companion to the picture of Apelles in which Alexander was seen, like a second Zeus, launching a thunderbolt. Among his principal ideal works are the colossal ‘Zeus’ at Tarentum; ‘Phœbus Apollo in his four horse Chariot’ at Rhodes; the bronze statue of ‘Opportunity’ at the entrance of a temple in Sicyon, of which several copies are extant; the colossal bronze statue of ‘Hercules’ at Tarentum, and the famous ‘Athlete,’ of which the ‘Apoxyomenus’ of the Vatican is a copy.

Lysol, a brown, oily liquid, having an odor resembling creosote. It is prepared from tar oil by saponification; is a useful antiseptic for the hands in a 1 or 2 per cent solution, and is chiefly used in obstetrical operations.

Lyte, līt, **Eliphalet Oram,** American educator: b. Bird-in-Hand, Pa., 29 June 1842. In his youth he served in the Union army during the Civil War. He was graduated from the State Normal School at Millersville, Pa., in 1868, was professor of English and pedagogics there, 1868–87, and has been principal of that institution from 1887. He was president of the National Educational Association 1890–9, and has published ‘Practical Bookkeeping’ (1883); ‘Grammar and Composition’ (1886); and other text-books.

Lyte, Henry Francis, English Anglican clergyman and hymn writer: b. Ednam, near Kelso, Scotland, 1 June 1793; d. Nice, France, 20 Nov. 1847. He was graduated from Trinity College, Dublin, and took orders in the Anglican Church, 1815. He was curate of Lower Brixham, Devonshire, 1823–47. He published ‘Tales Illustrative of the Lord's Prayer’ (1826); ‘Poems, Chiefly Religious’ (1833); ‘Miscellaneous Poems’ (1868); ‘Memoir of Henry Vaughan’; ‘Abide With Me’; ‘Pleasant Are Thy Courts’; ‘Jesus, I My Cross Have Taken’; and other hymns of his have become widely popular both in America and England.

Lytle, lĭt'l, **William Haines,** American general and poet: b. Cincinnati, Ohio, 2 Nov. 1826; d. Chickamauga, Tenn., 20 Sept. 1863. He was graduated at Cincinnati College, studied law and practised for a short time. He served as a captain in the Mexican War, and later was a member of the Ohio Legislature. During the Civil War he was colonel of the 10th Ohio regiment and was brigadier-general of volunteers, having been promoted to that rank for gallant conduct. He was killed at the battle of Chickamauga. His best-known poem is the famous ‘Address of Antony to Cleopatra,’ the opening line of which is “I am dying, Egypt, dying.” Consult ‘Poems’ with ‘Memoir’ by Venable (1884). No complete collection of his works was published.

Lytton, lit'ŏn, **Edward Robert Bulwer-Lytton,** EARL OF, English poet and diplomatist: b. London 8 Nov. 1831; d. Paris 29 Nov. 1891. He was the only son of the well-known novelist, Bulwer-Lytton (q.v.). He was educated at Harrow and Bonn, and entered the diplomatic service in 1849, being appointed attaché at Washington, where his uncle, Lord Dalling, was minister. Subsequently he held diplomatic posts at Florence (1852) and other European capitals, and was secretary of legation successively at Copenhagen, Athens, Lisbon, and Madrid. In 1874 he was appointed minister at Lisbon, and was made viceroy of India by Disraeli in 1876. At a great durbar held at Delhi in 1877, he proclaimed Queen Victoria Empress of India. In the great famine of 1877–8 he conducted admirably the work of relief. He adopted an active policy in Afghanistan, which brought about the second Afghan war (1879). His administration was marked by notable internal reforms, such as the abolition of the inland customs, the repeal of duties on cottons, and the promulgation of new civil service rules. In 1880 he was created Earl of Lytton, and when the Conservative government retired in that year he sent in his resignation as viceroy. In 1887 he was appointed British ambassador at Paris. For many years Lytton was better known as a poet than as a diplomatist, under the pseudonym of «Owen Meredith.» His published works include: ‹Clytemnestra, and Other Poems› (1855); ‹The Wanderers› (1859); ‹Lucile› (1860), a story in rimed anapæstic couplets, which met with a very great popular success; ‹The Ring of Amasis› (1863); ‹Orval, or the Fool of Time,› which is the solitary representative in English of the great Polish school of mystic verse (1869); ‹Fables, in Song› (1874); ‹Speeches of Edward Lord Lytton,› with a memoir (1874); ‹The Life and Letters of Edward Bulwer, Lord Lytton› (1883, the narrative comes down only to 1832); ‹Glenaveril› (1885); ‹After Paradise› (1887); ‹King Poppy,› his best poetical work, abounding in lofty poetry and gay irony, appeared posthumously (1892). As a prose writer Lytton takes high rank.

Lytton, Lord. See Bulwer-Lytton, Edward.

M

M the thirteenth letter of the English and most of the other West European languages, is one of the four liquids, or semi-vowels; it is also classed as a labio-nasal, its sound being produced when with lips closed and the whole uvula lowered, the breath makes a humming noise as it issues through the nostrils. The lips play the same part in the pronunciation of m as in that of b, but in pronouncing b the nasal passage has no part. Hence when that passage is obstructed or closed the sound produced is that of b not of m.

The M as a capital letter has the same form in the Greek and the Latin alphabets and in all the alphabets derived from them, and in all those alphabets generally the same sound value.

In English there are a few words of Greek origin, mostly technical, in which mn begins a syllable or a word: in such cases the m is silent, for example, mnemonic, nemonic.

In many words derived from other languages the m of the original word is changed to n in English, examples: Comitatus (Lat.) county, or contrariwise n is changed to m; Anglo-Saxon henep becomes hemp. Often p is added after m to give that letter greater distinctness, for example, exemtus, exemptus, unkemmed, unkempt.

M. Quad. See LEWIS, CHARLES BERTRAND.

Maartens, Maarten, mär'tĕn mär-tĕnz, pseudonym of the Dutch author, J. M. W. VAN DER POORTEN SCHWARTZ: b. Amsterdam 15 Aug. 1858. He passed his early life in England; was educated in Germany and at the University of Utrecht, was admitted a barrister, but chose literature as a profession, and in 1890 published his first work, 'The Sin of Joost Avelingh,' which at once arrested the attention alike of critics and of reading public. This, like all his volumes, was written at first hand in English, not, as has been sometimes supposed, translated from Dutch MS. Maartens thus presents the curious instance of an author electing to address wholly a foreign public. Indeed, only with reluctance, to safeguard himself against unsatisfactory translations, did he consent to the publication of his books in Dutch. His further works are: 'An Old Maid's Love' (1891); 'A Question of Taste' (1891); 'God's Fool' (1892); 'The Greater Glory' (1894); and 'My Lady Nobody' (1895); 'My Poor Relations' (1905). In America 'The Greater Glory' first appeared, serially in 'The Outlook.' 'God's Fool' is perhaps Maartens' best, but 'The Sin of Joost Avelingh' and 'The Greater Glory' have had the greatest popular success. These books afford a by no means flattering picture of the Dutch *bourgeoisie,* but are admittedly accurate.

Maasin, mä-ä'sĭn. Philippines, (1) a pueblo of the province of Leyte, island of Visayas, situated on the extreme southwestern coast, 75 miles southwest of Tacloban. It is a handsome, well-built city, and has a large trade, mostly in hemp. Pop. 18,500; (2) a town of the province of Iloilo, Panay, on a tributary of the Sague branch of the Jalaur River, 18 miles northwest of Iloilo. Pop. 9,700.

Maastricht. See MAESTRICHT.

Maat, or **Mat,** in ancient Egypt, the goddess of truth and justice. She is said to have guided the souls of the dead to Osiris (q.v.).

Mab, the fairy queen of Connaught and a familiar name in Celtic folk-lore. Mab has been celebrated by Shakespeare and other English poets. The name is of uncertain origin, being variously derived from the Midgard of the Eddas, the Habundia or Dame Abonde of Norman fairy lore, and from the Cymric *mab,* a child. According to Voss, Mab was not the fairy queen, the same as Titania, this dignity having been ascribed to her only by mistaking the use of the old English word *queen,* which originally meant only a woman. Queen Mab is mentioned in Shakespeare's 'Romeo and Juliet,' Ben Jonson's 'Satyr,' Randolph's pastoral of 'Amyntas,' Drayton's 'Nymphidia,' and Milton's 'L'Allegro.'

Mabalácat, mä-bä-lä'kät, a pueblo of the province of Pampanga, Luzon, 16 miles north of Bacolor, the provincial capital. It is on the main road, and on the Manila and Dagupan railroad. Pop. 10,600.

Ma'bery, mā'bėr-ĭ, **Charles Frederic,** American chemist: b. North Gorham, Maine, 13 Jan. 1850. He was graduated at the Lawrence Scientific School, Harvard, in 1876, and was assistant instructor in chemistry there from 1875 to 1883, since when he has been professor of chemistry in the Case School of Applied Science of Cleveland, Ohio. In the investigation of the composition of American petroleum his work has brought him into special prominence. He has also done valuable work in connection with the production of aluminum by means of electricity. The results of his original investigations at Harvard were largely published by him in papers appearing in the 'American Chemical Journal.'

Mabie, Hamilton Wright, American editor and author: b. Cold Spring, N. Y., 13 Dec 1845. He was graduated from Williams College in 1867, from the Columbia Law School in 1869, practised law in New York in 1869-79, in 1879 became connected with the 'Christian Union' (now 'The Outlook'), and in 1884 formally entered its editorial staff. He became known as a contributor of essays to periodicals, and as an occasional speaker and lecturer on educational and literary subjects. Among his public addresses was that at the dedication of the Zolnay bust of Poe in the University of Virginia. He also became president of the New York Kindergarten Association. His works are: 'Norse Stories Retold from the Eddas' (1882); 'Nature in New England' (1890); 'My Study Fire' (1st series, 1890; 2d, 1894; 3d, 1899); 'Under the Trees and Elsewhere' (1891); 'Short Studies in Literature' (1891); 'Essays in Literary Interpretation' (1892); 'Nature and Culture' (1897); 'Books and Culture' (1897); 'Work and Culture' (1898); 'In the Forest of Arden' (1898); 'The Life of the Spirit' (1899); 'Shakespeare: Poet, Dramatist and Man' (1900); 'Works and Days' (1902); 'Parables of Life' (1902).

Mabillon, Jean, zhŏṅ mä-bē-yôṅ, French ecclesiastic and author: b. St. Pierre du Mont, Champagne, 23 Nov. 1632; d. Paris 27 Dec. 1707. Having joined the Benedictines of Saint Maur, he was chosen to assist Dom Jean d'Achery in the compilation of his 'Spicilegium Veterum Scriptorum,' and subsequently edited the works of St. Bernard (1690) in the series of the fathers published by his congregation. In 1683 he was sent to Germany by Louis XIV. to collect documents relating to French history; and the applause with which his 'Iter Germanicum,' a narrative of the journey, was received, induced the king to send him to Italy in 1685 to make purchases for the royal library. A result of this tour was his 'Museum Italicum' (1687–9), a work of great value. Later he was selected by his superiors to refute Rancé, abbot of La Trappe, who had condemned the custom of permitting monks to study. His 'Essay on Monastic Studies,' which appeared in consequence in 1691, was equally remarkable for sound argument and good temper. His most important other works are: 'Vetera Analecta' (1675–85); 'De Re Diplomatica' (1681); and 'De Liturgia Gallicana' (1685). He edited and published with Ruinart 'Acta Sanctorum Ordinis Sancti Benedicti,' and published the first four volumes of the 'Annales Ordinis Benedictini' (1703–39). A collection of his 'Ouvrages posthumes' appeared in 1724, and his 'Inedited Correspondence with Montfaucon, Magliabecchi, etc.,' was edited by Valery (1847).

Mabini, mä-bē'nē, **Apollinario,** Filipino insurgent: d. Philippine Islands 1903. He was educated in the Catholic College of Manila, entered the public service under Spanish rule, became advocate of the treasury, resigned in 1896, and entered the insurrection. He became privy councillor of Aguinaldo, and for a time was minister of foreign affairs and chief of the supreme court in the latter's so-called government. In 1899 he surrendered to the United States, was sent into exile, but allowed to return in 1903. He was the brains of the Malolos government while it lasted.

Mabinogion, măb-ĭ-nō'gĭ ŏn, **The,** the name generally but incorrectly applied to all mediæval Welsh stories. Of the general title 'Mabinogion,' which Lady Charlotte Guest's English version (1838–49) has made familiar, John Rhys gives an explanation. «An idea prevails,» says Principal Rhys, «that any Welsh tale of respectable antiquity may be called a mabinogi; but there is no warrant for extending the use of the term. . . . For, strictly speaking, the word mabinog is a technical term belonging to the bardic system, and it means a literary apprentice. In other words, a mabinog was a young man who had not yet acquired the art of making verse, but who received instruction from a qualified bard. The inference is that the 'Mabinogion' meant the collection of things which formed the mabinog's literary training — *his* stock in trade, so to speak; for he was probably allowed to relate the tales forming the 'four branches of the Mabinogion' at a fixed price established by law or custom. If he aspired to a place in the hierarchy of letters, he must acquire the poetic art.» In Lady Charlotte Guest's later edition in one volume (1877),— the most convenient edition for reference,— 12 tales in all will be found. Of these, the most natively and characteristically Welsh in character are such tales as the vivid, thrice romantic 'Dream of Rhonabwy,' which owes little to outside sources. 'The Lady of the Fountain,' on the other hand, shows in a very striking way the influence of the French chivalric romances that Sir Thomas Malory drew upon so freely in his 'Morte d'Arthur.' In the admirably edited Oxford text of the Welsh originals by Rhys and Evans' (1887–90), 'The Lady of the Fountain' appears under the title of 'Owain and Lunet'; and Lunet's name at once recalls Tennyson's 'Idylls of the King.' The old manuscript volume of the 'Mabinogion,' known as the 'Llyfr Coch o Hergest,'—the 'Red Book of Hergest,'— is in the famous library of Jesus College, Oxford, the one college in the older English universities which has a time-honored connection with Welsh scholarship and Welsh literature.

Mably, Gabriel Bonnot de, gä-brē-ĕl bŏn-ō dė mä-blē, French ecclesiastic and publicist: b. Grenoble 14 March 1709; d. Paris 23 April 1785. His family name was Bonnot. Like his younger brother, the philosopher Condillac (q.v.), he was destined for the Church, and after studying at the seminary of Saint Sulpice in Paris was ordained subdeacon. He showed little liking for theology, and for some time was secretly employed in affairs of state by his relative Cardinal de Tencin, minister of Louis XV., conducting the most difficult negotiations and writing elaborate reports with an ability for which the minister received all the credit. Later he applied himself to literature, and in 1748 published his 'Droit publique de l'Europe,' which achieved a remarkable success. It was followed by 'Observations sur les Grecs' (1749); 'Observations sur les Romains' (1751); 'Entretiens de Phocion' (1753); 'Observations sur l'Histoire de France' (1755); 'Principes des Négociations' (1757); 'De la Manière d'écrire l'Histoire' (1773); 'De la Législation' (1776); 'De l'Idée de l'Histoire' (1778); and 'Principes de Morale' (1784). Having been requested by the government of Poland to prepare for them a code of laws, he visited that country in 1771, and published in 1781 a work 'Du Gouvernement de la Pologne.' He was also consulted by the American congress in 1783 on the preparation of the Constitution, and embodied his views in his 'Observations sur le Gouvernement et les Lois des Etats Unis d'Amerique' (1784). In this work he foretold the speedy downfall of the United States. Consult: Guervier, 'L'Abbé Mably, Moraliste et Politiqué' (1886).

Mabuchi, mä-boo'chē, Japanese writer and religious teacher: b. 1693; d. 1769. He was distinguished as a scholar, and utilized his great learning in the endeavor to purify the native religion, Shinto, from the accretions of Chinese and Buddhist philosophy, etc., whereby he regarded it as having been corrupted. His love and knowledge of antiquity enabled him to present the native faith in its original simplicity, and his teachings were exemplified in his own life. To him modern students are largely indebted for direct success to ancient Japanese poetry.

Mac, or **Mc,** a Gaelic prefix, as MacGregor, MacDonald, McKinley, etc. It corresponds with son in surnames of Teutonic origin, Fitz in those of Romance origin, or Ap or Ab in Welsh surnames.

Macabebe, mā-kā-bā'bā, Philippines, a pueblo of the province of Pampanga, Luzon, situated at the head of the Pampanga River delta, 9 miles from Manila Bay and 7 miles southeast of Bacolor. Pop. 10,400.

Macaber (mạ-kā'bėr) **Dance.** See DANCE OF DEATH.

Macadam, măk-ăd'ạm, **John Loudon,** Scottish engineer: b. Ayr 21 Sept. 1756; d. Moffat, Dumfriesshire, 26 Nov. 1836. In 1770 he was sent to an uncle at New York, where he remained during the War of Independence, and realized a considerable fortune as agent for the sale of prizes. At the close of the War he returned to Scotland, and in 1798 was appointed agent for revictualing the navy in the western ports of Great Britain, and took up his residence at Falmouth. He afterward resided for many years at Bristol. It was here, in 1815, on being appointed surveyor-general of the Bristol roads, that he first had full scope for putting in practice the important improvements in road-making which had long before occupied his thoughts. By 1823 his general success was admitted; and in 1827 he was made general surveyor of roads. In carrying out his improvement he had expended several thousand pounds from his private resources; and the House of Commons, having been satisfied of the fact by the investigation of a committee, both reimbursed the actual outlay, and presented him with an honorary tribute of £2,000, presenting to him a total of £10,000. His invention was rapidly introduced throughout the civilized world, and his own name was made synonymous with it.

Macadam, a modern system of road-making invented by J. L. Macadam (q.v.), which consists in forming the roads out of hard materials such as granite, or basalt broken into pieces, none of which are too large to pass through an iron ring 2½ inches in diameter, and then deposited evenly in a bed of from 6 to 12 inches in thickness. The bed thus laid becomes perfectly compact and smooth; and in proportion as it is worn away, or cut into ruts by traffic, can easily be restored by a new coating of materials. See ROADS AND ROAD-MAKING.

McAdoo, măk-ạ-doo', **William Gibbs,** American jurist: b. near Knoxville, Tenn., 4 April 1820; d. 1894. He was graduated in 1845 from the East Tennessee University at Knoxville, sat in the Tennessee Legislature 1845–6, and served in the Mexican War in 1847. He was afterward admitted to the bar and was attorney-general of the Knoxville judicial district, 1851–60. He removed to Georgia in 1862. served in the Confederate army during the Civil War and in 1871 became judge of the 20th judicial district of Georgia. With H. C. White he published 'Elementary Geology of Tennessee.'

McAfee, mạ kăf'ē, **Robert Breckinridge,** American historian: b. Mercer County, Ky., February 1784; d. there 12 March 1849. From 1833 to 1837 he was United States *chargé d'affaires* at Bogota, Colombia, and he was a member of the Royal Antiquarian Society of Denmark. He published 'History of the War of 1812' (1816), and much important information has been gleaned from his private journals relating to the early history of his native State.

McAlester, mạ-kăl'ĕs-tėr, **Miles Daniel,** American general: b. New York 1833; d. 1869. He was graduated from the United States Military Academy in 1856, and entering the engineer service became chief engineer of the department of the Ohio in 1862. In 1864 he was brevetted colonel and a year later brigadier-general.

MacAlester College, a coeducational institution in St. Paul, Minn.; founded in 1885 under the auspices of the Presbyterian Church. Its departments are academic, collegiate, and musical. It also conducts a summer school with brief courses connected with the three departments. The degrees granted are A.B. and Lit.B. In 1903 there were connected with the school 15 teachers and nearly 200 students. The library contained about 8,000 volumes, and the income from tuitions and other sources was about $14,000.

McAll (mạ-kāl') **Mission,** a Protestant association founded in 1871 by Robert Whitaker McAll (q.v.), and his wife, for religious work among the working people of France. On 17 Jan. 1872 the first station was opened in Belleville, one of the manufacturing suburbs of Paris. The work consists largely in striving to interest people in the questions pertaining to salvation of souls, and then urging them to affiliate with some one of the nearby Protestant churches. No effort is made by the Mission to establish churches, but some educational work has been begun in the large cities. Reports of the work for the year 1902 give in France 72 stations there the meetings are held in halls, and two mission boats. Friends of the movement in America, founded an American McAll Mission in 1883 with Philadelphia as headquarters. There are now in the United States about 65 auxiliary associations that collect and send to the French missions about one half of the whole amount of annual expenditures. The expense of the French work, in 1902, was $68,302. Great Britain has 22 auxiliary associations and Canada 10. Friends in other countries contribute to the support of the missions.

McAllister, Samuel Ward, American society leader: b. Savannah, Ga., about 1830; d. 1895. He came of a family several of whose members were conspicuous at the bar. With his father, in 1850, he went to California, where he remained two years, and whence he removed to Newport, R. I., and afterward to New York city. Becoming possessed by marriage of a considerable fortune, he was able, by means of influential connections through his mother and wife, to enter into social life with the advantages of personal qualification and family prestige. As a raconteur as well as an accomplished gourmet he had already attained prominence within a select circle when, by a well-turned remark, he became the leader of leaders in New York society, which, according to his strict limitation, included but 400 persons. The popular expression «The Four Hundred» originated from this assertion of McAllister's. He made contributions to the press, which, however, impaired rather than strengthened his unique position, as did also his volume 'Society as I have Found It' (1890).

McAllister. Fort. See FORT McALLISTER.

McAlpine, mä-kăl'pĭn, **William Jarvis,** American engineer: b. New York 1812; d. New Brighton, Staten Island, N. Y., 16 Feb. 1890. He took up engineering in 1827 under J. B. Jervis, with whom he continued till 1839, and succeeded him as engineer of the Erie Canal enlargement. In 1851 he became State engineer of New York and State Railroad Commissioner 1855–7. He was subsequently engineer of several important railways, constructed the city waterworks at Albany and Chicago, and in 1870 his plans for improvement of the Cataracts of the Danube were accepted by the Austrian government. While engineer of the department of parks 1879–80, he constructed the Riverside Drive in New York.

Macao, mä-kow' or mä-kä'ō, China, a Portuguese settlement and seaport on the west shore of the mouth of the Canton River, 40 miles west of Hong-Kong. It occupies a high peninsula, formerly the island of Macao, but now united by a narrow isthmus north of the town with the island of Hiang-shan. The settlement is about eight miles in circuit; and its limits landward are defined by a barrier wall stretching across the isthmus, where a guard of Chinese troops is stationed to prevent foreigners from trespassing on the Inner Land. The town occupies a slope gradually descending to the sea, backed by a range of lofty hills, and having an extensive plain stretching east. It is nearly surrounded with water, and is open to the sea-breezes on every side. The houses occupied by the foreign population are large, roomy, and open; and the shops are numerous. The quay or «Praya Grande» is commodious, forms a pleasant drive, and is protected by a battery. The harbor is formed between the peninsula on which the town stands and the large island of Twee-lien-shan, to the west. Macao is considered the healthiest residence in southeast Asia. Near it, in a beautiful garden, is the grotto in which the poet Camoens is said to have finished the 'Lusiad.' The principal exports are tea, cassia and cassia oil, anise and anise oil, and opium. The commerce, which is chiefly carried on with Hong-Kong, Canton, Batavia, and Goa, has greatly declined since the opening of the rival free ports, and a considerable part of the colonial revenue, which amounts to about $375,000, is drawn from a tax on the gambling tables for which Macao is notorious. The Portuguese first obtained permission to form a settlement and to trade at Macao in 1557. From 1563 they were required to pay a yearly tribute to the Chinese government, and their trading privileges were much restricted till 1844, when they were allowed to carry on commerce with the five ports then open to foreigners. Macao was then declared a free port, but the Chinese continue to ignore the territorial claims of the Portuguese. Pop. (1896) 78,627, inclusive of 74,568 Chinese, 3,898 Portuguese and 116 foreigners.

Macaque, ma-kăk', one of the small, short-tailed Asiatic monkeys of the genus *Macacus* and family *Cercopithecidæ,* which are so docile, intelligent and interesting as a rule that they are common in menageries and frequently kept as pets; their gentleness and playfulness disappears as they grow old, however, and they are then likely to become morose and savage. They go about in troops, keeping by themselves, and differing from other monkeys in most of their actions and cries. Some of the best known are the quaintly crested capuchin, or bonnet-monkey (*M. sinicus*), excessively common and pestiferous in southern India; the entellus monkey (q.v.) of northern India; the large pig-tailed (*M. leoninus*) of Japan, whose likeness is seen in numberless Japanese drawings and carvings. Ranging over so wide a variety of countries their habits and food differ greatly. Besides the fruit, juicy leaves and insects eaten by most monkeys they devour small reptiles, young birds, frogs, and crabs, the last-named forming the principal diet of a Malayan species (*M. cynomolgus*). One species is isolated in the mountains of Algeria and Morocco, whence they were long ago carried, no doubt, to the island of Gibraltar, where they are known to the English of the garrison as «Barbary apes» (*M. inuus*), and the small band upon the Rock are carefully protected from harm.

Macaro'ni (Ital. *maccheroni*), a peculiar paste or dough prepared from wheat flour and manufactured into tubes or ribbons. It is an Italian invention, and, though made by a simple process, has never been produced with so great success in any other country. The grain grown in the more southern countries of Europe is said to possess a greater amount of gluten, and is therefore better adapted to this manufacture. The wheat, after being washed, is freed from the husks and ground in water mills, when hot water is added till it is of the consistency of stiff dough. Five different qualities of flour are obtained by an equal number of siftings, the last giving the finest and most delicate that can be made. To reduce the dough to tubes or ribbons, a hollow cylindrical cast iron vessel is used, having the bottom perforated with holes or slits. When this is filled with the paste, a heavy iron plate is driven in by a powerful press, which forces the paste through the holes, and gives it the shape of the perforations, the workman cutting off the pieces of the desired length as they come through. During this process it is partially baked by a fire made under the cylinder. Sometimes the flat pieces are formed into tubes by uniting the edges before they are thoroughly dry. After being hung up for a few days they are ready for use. The largest tubes are called *maccheroni,* the smaller *vermicelli,* and the smallest *fedelini.* Macaroni is prepared for the table by boiling and baking with grated cheese, and is in common with vermicelli and the other varieties much used in the preparation of soups. Since about 1880 the use of macaroni in the United States has largely increased, and where it was once only consumed by Italians in this country, it is now eaten by all classes. Numerous macaroni factories have been established in New York and elsewhere. The United States imports annually from Italy over 500,000 boxes of macaroni.

Macaron'ic Verse, a kind of facetious poetry in which foreign words are distorted and jumbled together; so called by Teofilo Folengo, a Mantuan monk of noble family, who published a book entitled 'Liber Macaronicorum,' a poetical rhapsody, made up of words of different languages. His principal poem was called macaronic, because it was mixed up of Latin and Italian, as macaroni is mixed up with cheese. Consult Morgan, 'Macaronic Poetry' (1872).

MacArthur, Arthur, American general: b. Massachusetts 1 June 1845. Having enlisted in the United States volunteer service in Wisconsin he served through the Civil War period, being promoted lieutenant-colonel and brevet-colonel in May 1865, for gallant and meritorious conduct in the battles of Perryville, Ky., Stone River, Tenn., Mission Ridge and Danridge, Ga., Franklin, Tenn., and in the Atlantic campaign. He was mustered out of the volunteer service in June 1865, and entered the regular army with the rank of lieutenant in the 17th United States infantry the following year. In the Spanish-American War he was appointed a brigadier-general of volunteers, and assigned to the Philippine expeditionary forces. He was promoted brigadier-general in the regular army, 2 Jan. 1900; commander of the Military Division of the Philippines and promoted major-general U. S. A., 1901. He returned to the United States in 1901, and in 1902 had command of the land forces in the combined military and naval maneuvers along the Atlantic coast.

MacArthur, Duncan, American pioneer: b. Dutchess County, N. Y., 14 June 1772; d. Ohio 1839. His family removed in 1780 to the western frontier of Pennsylvania, where he was early inured to the labors and privations of border life. At 18 years he went to seek his fortune in the wilderness, and participated as a ranger or scout in the warfare with the Indians in Kentucky and Ohio, until the victory of Gen. Wayne in 1797 gave peace to the western country. About the commencement of the present century he settled in Ohio as a surveyor, and in 1805 became a member of the Ohio legislature, and was appointed major-general of the territorial militia. In the War of 1812 he received the commission of brigadier-general in the army, and succeeded General Harrison in 1814 in command of the army of the West. After the peace, as a joint commissioner with Gen. Cass, he negotiated the treaty with the Indians of Ohio for the sale of their lands in that State, which was ratified in 1818. He served again in the Ohio legislature 1815–21, and in 1823–5 was a representative in congress from that State. In 1830 he was elected governor of Ohio, which position he occupied until 1832.

McArthur, Robert Stuart, American Baptist clergyman: b. Dalesville, Quebec, 31 July 1841. He was graduated from the University of Rochester, N. Y., in 1867, and from the Rochester Theological Seminary there in 1870, and since May of the last named year has been pastor of Calvary Baptist Church, New York. He was for a long period connected editorially with the 'Christian Inquirer' and 'Baptist Review,' has lectured on foreign travel, and published, among many other works, 'Calvary Pulpit'; 'Current Questions for Thinking Men' (1898); 'Lectures on the Land and the Book'; 'Around the World' (1899); 'Old Testament Difficulties.'

Macaulay, ma̤-kâ'lĭ, **Catharine Sawbridge,** English historian: b. Wye, Kent, 2 April 1731; d. Binfield, Berkshire, 22 June 1791. In 1760 she was married to George Macaulay, a London physician. She was an ardent Republican, and a great admirer of Washington, with whom she corresponded, and whom she visited in 1785. She published a 'History of England from the Accession of James I. to the Revolution' (8 vols. 1763–71), once very popular, and eulogized by Pitt in the House of Commons, but now neglected.

Macaulay, James, Scottish novelist: b. Edinburgh 22 May 1817; d. there 20 June 1902. He was educated at the University of Edinburgh, and for 35 years was in the service of the Religious Tract Society as editor-in-chief. In 1851–7 he was joint editor of the 'Literary Gazette,' and in 1858 became editor of the 'Leisure Hour Sunday at Home.' 'The Boy's Own Paper' and 'The Girl's Own Paper' were founded by him. He was a voluminous writer, and among his published works the following may be mentioned: 'Across the Ferry: First Impressions of America and its People' (1871); 'Memory Helps in British History' (1873); 'All True: Records of Adventure' (1879); 'Luther Anecdotes' (1883); 'Gordon Anecdotes' (1885); 'Livingstone Anecdotes' (1886); 'Wonderful Stories of Daring, Peril and Adventure' (1887); and 'Victoria, Her Life and Reign' (1887).

Macaulay, Sir James Buchanan, Canadian jurist: b. Niagara, Ont., 3 Dec. 1793; d. Toronto 26 Nov. 1859. He was an ensign in the British army during the War of 1812, and subsequently studying law was admitted to the bar in 1812. In 1829 he was appointed a judge of the king's bench, from 1849 to 1856 he was chief justice of the court of common pleas, and just prior to his death became judge of the court of error and appeal. He was knighted in 1859.

Macaulay, Thomas Babington, English statesman, essayist, and historian: b. Rothley Temple, Leicestershire, the seat of his uncle, Thomas Babington, Esq., 25 Oct. 1800; d. Kensington, London, 28 Dec. 1859. As a child he was remarkable for his precocity, and bright and merry disposition; from the age of three he became a voluminous reader with a marvelously retentive memory, and was a great favorite with Hannah More, whose judicious gifts of books laid the foundation of his library. He received his early education at private schools, where he displayed in a high degree many of the mental characteristics which later in life made him famous. The eagerness with which he read and assimilated information of the most miscellaneous description; the wonderful powers of memory which enabled him to recall after the lapse of many years whole pages and poems, read but once; the quickness of perception by the aid of which he could at a glance extract the contents of a printed page; his love of novels and poetry; his volubility, positiveness of assertion, and the astonishing amount of information he could pour out on matters of even trivial importance were as characteristic of the boy as of the man.

At the age of 16 he wrote an anonymous letter defending novel-reading, and lauding Fielding and Smollett, which he addressed to his father, then editor of the ‹Christian Observer.› It was inserted in utter ignorance of the author, and brought down on the periodical the wrath of a host of subscribers. One declared that he had committed the obnoxious number to the flames and would never again read the magazine.

In 1818 Macaulay went into residence at Trinity College, Cambridge; the following year he wrote the English prize-poem, the subject being ‹Pompeii,› and won a prize for Latin declamation; in 1821 he again wrote the English prize-poem with ‹Evening› as a subject, gained one of the Craven scholarships, and received the annual college prize for an essay on the character of William III.; in 1824, after two failures, he was elected a fellow of Trinity.

In deference to the wishes of his father, who had suffered financial reverses, he read law, and in 1826 was called to the bar. But the labors of the profession were little to his liking; no business of consequence came to him; and he was soon deeply engaged in literature and politics. At 23 he began to write for Knight's ‹Quarterly Magazine,› and contributed to it articles, some of which — as ‹The Conversation between Mr. Abraham Cowley and Mr. John Milton touching the Great Civil War›; his criticism of Dante and Petrarch; that on ‹Athenian Orators›; and the ‹Fragments of a Roman Tale› — are still given a place in his collected writings. They served to draw attention to the author at the time when Jeffrey, editor of the ‹Edinburgh Review,› was eagerly and anxiously searching for «some clever young man» to write for it. Macaulay was such a clever young man. Overtures were therefore made to him; and in 1825, in the August number of the ‹Review,› appeared his essay on John Milton. The effect was immediate. He was praised and complimented on every hand, and day after day saw his table covered with cards of invitation to dinner from every part of London. And well he might be praised; for no English magazine had ever before published so readable, so eloquent, so entertaining an essay. Its very faults are pleasing. Its merits are of high order; but the passage which will best bear selection as a specimen of the writing of Macaulay at 25 is the description of the Puritan.

Macaulay had now found his true vocation, and entered on it eagerly and with delight. In March 1827 came the essay on Machiavelli; and during 1828 those on John Dryden, on History, and on Hallam's ‹Constitutional History.› During 1829 he wrote and published reviews of James Mill's ‹Essay on Government› (which involved him in an unseemly wrangle with the Westminster ‹Review,› and called forth two more essays on the ‹Utilitarian Theory of Government›), Southey's ‹Colloquies on Society,› Sadler's ‹Law of Population,› and the reviews of Robert Montgomery's Poems. The reviews of Moore's ‹Life of Byron› and of Southey's edition of the ‹Pilgrim's Progress› appeared during 1830, the same year that he became a member of Parliament for Calne.

At college, Macaulay had been converted from the Tory politics of his father's circle of friends to those of the Whig party, and as a student was a prominent speaker at the Cambridge Union. His fame as a public speaker was further enhanced by a speech in 1824 at a meeting of the Anti-Slavery Society; and in 1828 as leader of a party of London Whigs he succeeded in overthrowing a vote in the Cambridge senate for a petition against Catholic emancipation. Notwithstanding his politics, Lord Lyndhurst appointed him a commissioner in bankruptcy in 1828, and in 1830 Lord Lansdowne offered him a seat in Parliament, which Macaulay accepted. The following year his speech during the debate upon the second reading of the Reform Bill created a furore, and his abilities were recognized by his appointment as secretary of the board of control. In December 1831 he was elected a member for Leeds, and in 1832 was appointed a commissioner of the board of control, in this capacity carrying through Parliament the bill for renewing the charter of the East India Company. He accepted an offer of a seat on the supreme council of India, and sailed for India in February 1834. During an official residence of three years and a half in India he worked hard at his duties, took an active interest in the foundation of the native educational system, and left as the chief monument of his labors a criminal code, and a code of criminal procedure which became law in 1860. After he reached England in 1839 he was elected member of Parliament for Edinburgh, and in September was made secretary for war with a seat in the cabinet. He was relieved from office by the overthrow of the ministry in 1841; in 1842 he was prominent in the debate on the copyright bill; and was an active opponent of Peel until the latter's downfall in 1845. Macaulay was appointed paymaster-general under Lord John Russell's administration; was re-elected for Edinburgh in 1846, but was defeated in 1847 chiefly on the ground of his stand against religious intolerance; Edinburgh, however, in 1852, renewed its allegiance by returning him, unsolicited and unpledged, at the head of the poll.

After entering Parliament, and during his Indian career, his celebrated essays appeared less frequently, but after his return to England all his spare time from politics was devoted to literature. A reply to a pamphlet by Mr. Sadler, written in reply to Macaulay's review, the famous article in which Croker's edition of Boswell's Johnson was pilloried, and the essay on John Hampden, were all he wrote in 1831. In 1832 came ‹Burleigh and his Times,› and ‹Mirabeau›; in 1833 ‹The War of the Succession in Spain,› and ‹Horace Walpole›; in 1834 ‹William Pitt, Earl of Chatham›; in 1835 ‹Sir James Mackintosh›; in 1837 ‹Lord Bacon,› the finest yet produced; in 1838 ‹Sir William Temple›; in 1839 ‹Gladstone on Church and State›; and in 1840 the greatest of all his essays, those on Von Ranke's ‹History of the Popes› and on Lord Clive. ‹The Comic Dramatists of the Restoration›; ‹Warren Hastings,› and a short sketch of Lord Holland, were written in 1841; ‹Frederick the Great› in 1842; ‹Madame D'Arblay› and ‹Addison› in 1843; ‹Barère› and ‹The Earl of Chatham› in 1844; and with these the long list closes.

Never before had the English reading public been instructed and amused by so splendid a series of essays. The range of topics covered by him was enormous; art, science, theology, history, literature, poetry, the drama, philosophy, all were passed in review. Concerning the present he knew little and cared less. Sympathy with the past is Macaulay's ruling passion, and he has never once failed to treat his subject historically. We look in vain for the faintest approach to a philosophical or analytical treatment. He reviewed Mill's essay on 'Government' and Hallam's 'Constitutional History'; but made no observations on government in the abstract, nor expressed opinions as to what sort of government is best suited for civilized communities in general. He wrote about Bacon; yet never attempted to expound the principles or describe the influence of the Baconian philosophy. He wrote about Addison and Johnson, Hastings and Clive, Machiavelli and Horace Walpole, and Madame D'Arblay; yet in no case did he analyze the works, or fully examine the characteristics, or set forth exhaustively the ideas, of one of them. They are to him mere pegs on which to hang a splendid historical picture of the times in which these people lived. In the essays on Clive and Hastings, we find little of the founders of British India beyond the enumeration of their acts. But the Mogul empire, and the rivalries and struggles which overthrew it, are all depicted in gorgeous detail. No other writer has ever given so fine an account of the foreign policy of Charles II. as Macaulay has done in the essay on Sir William Temple; nor of the Parliamentary history of England for the forty years preceding our Revolution, as is to be found in the essays on Lord Chatham. In each case the image of the man whose name stands at the head of the essay is blurred and indistinct. We are told of the trial of John Hampden; but we do not see the fearless champion of popular liberty as he stood before the judges of King Charles. We are introduced to Frederick the Great, and are given a summary of his characteristics and a glowing narrative of the wars in which he won fame; but the real Frederick, the man contending "against the greatest superiority of power and the utmost spite of fortune," is lost in the mass of accessories. He describes the outward man admirably; the inner man is never touched.

But, however faulty the 'Essays' in respect to the treatment accorded to individual men, they display a prodigious knowledge of the facts and events of the periods they cover. His wonderful memory, stored with information gathered from a thousand sources, his astonishing power of arranging facts and bringing them to bear on any subject, whether it called for description or illustration, joined with a clear and vigorous style, enabled him to produce historical scenes with a grouping, a finish, and a splendor to which no other writer can approach. His picture of the Puritan in the essay on Milton, and of Loyola and the Jesuits in the essay on the Popes; his description of the trial of Warren Hastings; of the power and magnificence of Spain under Philip II.; of the destiny of the Church of Rome; of the character of Charles II. in the essay on Sir James Mackintosh — are but a few of many of his bits of word-painting which cannot be surpassed.

While Macaulay was writing two and three essays a year, he won renown in a new field by the publication of 'The Lays of Ancient Rome.' They consist of four ballads — 'Horatius'; 'The Battle of the Lake Regillus'; 'Virginius'; and 'The Prophecy of Capys' — which are supposed to have been sung by Roman minstrels, and to belong to a very early period in the history of the city. The 'Lays' (1842) at once found their way into popular favor. In 10 years 18,000 copies were sold in Great Britain; 40,000 copies in 20 years; and before 1875 nearly 100,000 had passed into the hands of readers.

The same popularity attended the 'Essays.' Again and again Macaulay had been urged to collect and publish them in book form, and had refused. But when an enterprising publisher in Philadelphia not only reprinted them but shipped copies to England, Macaulay gave way; and in the early months of 1843 a volume was issued. Like the 'Lays' the 'Essays' rose at once into popular favor, and in the course of 30 years 120,000 copies were sold in the United Kingdom by one publisher.

But the work on which he was now intent was the 'History of England from the accession of King James the Second down to a time which is within the memory of men still living.' The idea of such a narrative had long been in his mind; but it was not till 1841 that he began seriously to write, and not till 1848 that he published the first and second volumes. Again his success was instant. Nothing like it had been known since the days of Waverley. The publishers sold 13,000 copies of Macaulay in four months. In the United States the success was greater yet. Astonishing as was the success, it never flagged; and year after year the London publisher disposed of the work at the rate of 70 sets a week. In November 1855, the third and fourth volumes were issued. Confident of an immense sale, 25,000 copies were printed as a first edition, and were taken by the trade before a copy was bound. In the United States the sale, he was assured by Everett, was greater than that of any book ever printed, save the Bible and a few school-books in universal use. Prior to 1875, 140,000 copies of the 'History' were sold in the United Kingdom. In 10 weeks from the day of the issue 26,500 copies were taken, and in March 1856 $100,000 was paid him as a part of the royalty due in December.

Honors of every sort were now showered on him. He was raised to the peerage as Baron Macaulay of Rothley; he was rich, famous, and great. But the enjoyment of his honors was short-lived; weakness of the heart's action had developed shortly after his last election at Edinburgh, and in December 1859 he was found in his library, seated in his easy-chair, dead.

All that has been said regarding the 'Essays' applies with equal force to the 'History of England.' No historian who has yet written has shown such familiarity with the facts of English history, no matter what the subject in hand may be; the extinction of villeinage, the Bloody Assizes, the appearance of the newspaper, the origin of the national debt, or the state of England in 1685. Macaulay is absolutely unrivaled in the art of arranging and combining his facts, and of presenting in a clear and vigorous narrative the spirit of the epoch he treats.

Nor should we fail to mention that both ‹Essays› and ‹History› abound in remarks, general observations, and comment always clear, vigorous, and shrewd, and in the main very just.

Consult Milman, ‹Life,› prefixed to Vol. VIII. of the ‹History of England› (1858–62); Arnold, ‹Public Life of Lord Macaulay› (1862); Trevelyan, ‹Life and Letters of Lord Macaulay› (1876); Morison ‹Macaulay› (1882).

McAuley, Catherine, Irish founder and first superior of the Sisters of Mercy: b. Stormont House, County Dublin, Ireland, 29 Sept. 1787; d. Dublin, 11 Nov. 1841. In childhood she was adopted by a wealthy Protestant family who allowed her to remain in the church of her father, the Roman Catholic, and left her a large fortune which she wished to use for the benefit of the poor. She first erected a commodious house wherein might be taught a number of poor children, and where homeless young women might find lodging and board. This institution was opened in Dublin, 24 Sept. 1827, but the religious order was not established until 12 Dec. 1831. The members of the order take the vows of poverty, chastity, and obedience; and the works which they perform are visiting the poor, sick, and imprisoned, teaching, establishing hospitals, orphanages, homes for the friendless and other works of mercy. There are houses of her order in nearly all parts of the world. In the United States it comprises about 6,000 members. The order includes a college for young women, at Mount Washington, Md., a large number of academies, high and elementary schools, and hospitals and orphanages in nearly every State in the Union. Consult: Hartnett, ‹Memoir of Mother McAuley›; Murphy, ‹Sketches of Irish Nunneries›; Member of Order of Mercy, ‹Life of Catherine McAuley.›

Macaw, mạ-kâ', or **Arara,** a large South American parrot, of the family *Arinæ*. They are arrayed in plumages of scarlet, deep red, brilliant green, and deep yellow, or a combination of these gaudy colors, so that a flock of them in the sunshine is one of the gayest sights the tropics afford. They have long pointed wings, very long pointed tails, and are powerful fliers. Dwelling mainly in the forests, they feed on seeds and fruits, as a rule, but often descend in flocks upon plantations and do great damage, especially to coffee and maize. These birds are easily domesticated, and become very friendly, but they do not talk well, cannot be taught to restrain their shrill screaming, and so are not desirable except as outdoor ornaments for a large lawn. See Parrot.

Macaw-tree, or **Macaw-palm** (also called gru-gru), a tropical American palm (*Acrocomia sclerocarpa*), known by still other names in different countries of South America. It attains a height of about 25 feet, and has pinnated leaves, sometimes 12 or 15 feet in length. It is allied to the cocoanut, and its fruit yields a sweetish oil resembling butter in color and consistence, used as a remedy in rheumatism, etc., and as palm-oil exported for scenting.

Maçayo, mä-sī-ō', Brazil. See Maceio.

Macbeth', or **Macbethad, MacFinlegh,** king of Scotland who reigned from 1040 to 1057. The facts of his life, so far as known, are these. During the reign of Duncan he was «mormaer» of Moray by inheritance, and by his marriage with Gruoch, grand-daughter of Kenneth IV. Duncan, in his attempt to subdue the independent chiefs of the north, was slain by Macbeth at Bothgowan, supposed to be near Elgin. By this means Macbeth became king, and, according to accounts, his reign was fairly successful. He was finally defeated in battle and slain by the sons of Duncan at Lumphanan, Aberdeen (1057). The legends which gradually gathered round the name of Macbeth were collected by John of Fordun and Hector Boece, and reproduced by Holinshed in his ‹Chronicle.› These writers appear to have overlooked the excellent qualities of Macbeth as king, and regarded him with horror as a usurper. Consult: Robertson, ‹Scotland under her Early Kings› (1862); Skene, ‹Celtic Scotland› (1876–80).

Macbeth, a tragedy by Shakespeare, written about 1605, and printed in the first folio edition of Shakespeare 1623. See preceding.

McBurney, măk-bėr'nĭ, **Charles,** American surgeon: b. Roxbury, Mass., 17 Feb. 1845. He was graduated at Harvard in 1866; and from the Columbia Medical School in 1870, and has since practised his profession in New York. He was professor of surgery in the College of Physicians and Surgeons, New York, and has been visiting and consulting surgeon at St. Luke's, the Presbyterian, Roosevelt, New York Orthopedic, and other hospitals. When President McKinley was shot, Dr. McBurney was summoned to Buffalo as consulting surgeon.

McBurney, Robert Raikes, American religious worker: b. Castleblaney, Ireland, 31 March 1837; d. Clifton Springs 27 Dec. 1898. He came to the United States in 1854, and from 1862 was the general secretary of the New York Young Men's Christian Association. He was devoted to his work, and with the progress of years came to be recognized as the leading Y. M. C. A. secretary in the world.

McCabe, mạ-kāb', **Charles Cardwell,** American Methodist bishop: b. Athens, Ohio, 11 Oct. 1836. He was educated at Ohio Wesleyan University. In 1860 he entered the Methodist Episcopal ministry, and in 1862 was appointed chaplain of the 122d Ohio Infantry. At the battle of Winchester he was captured, and held in Libby prison for four months, and soon after his release entered the service of the United States Christian Commission and succeeded in raising a large amount of money for its work. Later he became financial agent for Wesleyan University; and in 1884 was made secretary of the Methodist Episcopal Missionary Society. He has been remarkably successful in raising large amounts of money for missionary purposes. He became a bishop of his Church in 1896, and in December 1902 was elected chancellor of the American University at Washington, D. C.

Maccabees, măk'ạ-bēz, two books of the Scriptures considered by the Roman Catholic Church as inspired, and therefore included in the canon. The Protestant bodies hold them to be of high historic value, but at the Reformation they were excluded from the canon as not to be considered a part of the inspired Word of God. They are, therefore, classed in the Apocrypha (q.v.). They were also excluded from the Jewish canon, as well as from that of the

Greek Church, and while the Church of England allows them to be read aloud in public worship, it declares in Article VI. these "books" . . . "the Church doth read for example of life and instruction of manners; but yet doth not apply them to establish any doctrine." The main objection made by Protestants to their canonicity seems to be that they favor prayers for the dead, as in the passage Macc. xii. 45.

The books of the Maccabees are of high interest, and record in a tone of lofty enthusiasm the heroic struggle of the Jewish people to maintain their independence against overwhelming odds. The political object of this struggle was ever of less importance to them than their religious object, namely, to vindicate the sanctity of the temple and the integrity of Jewish Levitical worship. The circumstances under which this struggle took place may be summarized as follows: When the whole East as far as the Punjab and the Indus had fallen subject to the arms of Alexander the Great, it is related that after conquering Syria in its northern and Phœnician territories, and taking Tyre and Sidon, he projected a southern campaign against the Jews, whose fertile territory and wealth had attracted his notice. Then, it is said, he saw a vision of the high priest Jaddua coming out to meet him on his march. He persisted, says Josephus, in continuing this expedition against Jerusalem, but when he approached the sacred city his vision came true, which so impressed him with superstitious awe that he made a treaty with the Jews, and turned back from his purpose of sacking the city of Zion, and wasting the country. In 323 Alexander died at Babylon and the Diadochi divided among themselves the area of his conquest. Syria fell to the lot of the Seleucidæ, one of whom, Antiochus Epiphanes, formed a design to extend his kingdom by the conquest of Palestine. On completing this design he showed himself as hostile to the Hebrew religion as he had been to their national independence.

The Hebrews might have tolerated the introduction of the Greek language into their homes and markets, or even of some Greek customs and laws. But when Antiochus proceeded to a high handed defiance of their religious beliefs and observances, they felt that the honor of God, the sacredness of the law, the sanctity of the temple, were to be vindicated. Their deep-seated and hereditary fanaticism was awakened and when they saw the image of Zeus set up in the holiest place, and the Jewish ritual abolished they entered upon that struggle which is related in the books of the Maccabees.

The date of that act of desecration by which pagan worship was instituted in the temple of Jehovah is the 25th of the month Chisleu (December) 168 B.C. Soon after this a champion of Jehovah arose in the village of Modin. A certain priest named Mattathias refused to sacrifice according to the Greek rite, and actually headed an insurrection against the officials of the government. A long series of patriotic wars ensued. The Syrian king found stubborn antagonists in the five sons of Mattathias, John, Simon, Judas, Eleazar and Jonathan, who were the generals of the Jewish armies. But although they are collectively styled Maccabees, the name is only proper to one, the greatest of them, Judas, who by his skill and intrepidity led on his countrymen from night attacks and sudden surprises to more open and important operations; and at length defeated Apollonius and Seron, who had marched to the attack with greatly superior forces, at Bethhoron, in the plain of Esdraelon, the battle-field of Palestine and the scene of some of the most glorious victories in Jewish annals. Lysias, the lieutenant of Antiochus, headed an expedition against the patriots, but Judas encountered him, and defeated him with signal loss. Judas now occupied Jerusalem, purified the temple three years after its profanation, and re-inaugurated the holy service. The anniversary day of this re-inauguration was afterward called the "Feast of the Dedication," and kept with solemn observances (John x. 22). Despite his successes the position of Judas was anything but secure, and in 163 B.C. Lysias took Bethsura, and laid siege to Jerusalem. He had guaranteed to the Jews the liberty of their religion; but he was put to death by Demetrius, a new claimant of the crown, who sent Nicanor against Judas. The Jewish leader defeated him first in a battle at Capharsalama, and then with total ruin at Adasa, but feeling the difficulty of continuing the contest against the whole power of the Syrian empire, solicited an alliance with the Romans. A Syrian army again invaded Palestine, before aid could reach him from his new allies. To 22,000 Syrian troops, led by Bacchides, Judas could oppose only 3,000. Though these had gradually diminished to 800 he resolved to attack the invaders, and after a desperate struggle he fell fighting with useless valor, 161 B.C. Judas derived his name from *Makkava*, a hammer, for he dealt many heavy blows to Syrian paganism. So Charles Duke of Austria, son of Pepin d'Heristal, was styled Charles the Hammer (Martel) for his defeat of the Saracens between Tours and Poitiers. The Maccabees have always been looked upon as the national heroes of the Jews, and they are reckoned as saints on the calendar of the Greek Church, and venerated as such.

Maccabees, Knights of the Modern. See KNIGHTS OF THE MODERN MACCABEES.

Maccabees, Ladies of the. See LADIES OF THE MACCABEES OF THE WORLD.

Maccabees, Ladies of the Modern. See LADIES OF THE MODERN MACCABEES.

Maccabees of the World. See KNIGHTS OF THE MACCABEES OF THE WORLD.

McCall, ma-kâl', **George Archibald,** American soldier: b. Philadelphia 16 March 1802; d. 25 Feb. 1868. He was graduated at West Point in 1822; in 1846 reached the rank of captain, and that of colonel in 1850. Having served against the Seminoles in Florida, he won distinction in the Mexican War; in 1850 he became inspector-general, resigning from the army three years later. In 1861 he was given command of the Pennsylvania Reserves, with the rank of brigadier-general of volunteers, and participated in the work of the Army of the Potomac, particularly in the Peninsular campaign of 1862, in which he was engaged with his troops at Mechanicsville, Gaines' Mill, and Frazier's Farm (qq.v.). At Frazier's Farm, 30 June, he was taken prisoner, and was confined for several weeks in Libby prison. In August he was exchanged, but impaired health prevented him from returning to the army, and in 1863 he resigned. He wrote ‹Letters From the Frontier› (1868).

McCal'la, Bowman Hendry, American naval officer: b. Camden, N. J., 19 June 1844. He was graduated at the United States Naval Academy in 1864, and rose by promotion through the ordinary grades to captain in 1898. In 1890 he was court-martialed on charges of cruelty to his subordinates and was suspended for three years, but in consideration of previous acts of gallantry was restored to active service in 1891. He commanded the Marblehead during the war with Spain in 1898 and was subsequently restored to the place he held on the list of officers previous to his suspension. In 1899 he commanded the Newark and aided in the pacification of the Philippines. In 1900 he co-operated with Vice-Admiral Seymour in putting a stop to the Boxer troubles at Peking in a manner which gained him the congratulations of the Navy Department. In 1901 he was given command of the Kearsarge.

McCam'mon, Joseph Kay, American lawyer: b. Philadelphia 13 Oct. 1845. He was graduated at Princeton in 1865; studied law in Philadelphia; became register in bankruptcy in 1870; was special counsel of the United States in Washington, 1871; president of the board for investigation of the Indian service, 1877; assistant attorney-general of the United States, 1880-5; and in 1881 was appointed United States commissioner of railroads. Under Presidents Garfield and Arthur, he conducted treaties with various Indian tribes. Among his writings are a ‹Report on Indian Service› (1878); ‹Report of Councils with Bannock and Shoshone Indians› (1881); ‹Report of Councils with Flathead and Other Indians› (1882); ‹Arguments in Cases Affecting Pacific and Other Railroads.›

McCarthy, mạ-kär'thĭ, **Justin,** Irish author and politician: b. Cork, Ireland, 22 Nov. 1830. He became connected with the Liverpool press in 1853 and in 1864 was made editor-in-chief of the Morning *Star*. Since 1879 he represented the Home-Rule party in Parliament. His stay in the United Sates extended from 1868 to 1870, during which period he was for some time connected editorially with the New York ‹Independent.› His main work is ‹History of Our Own Times› (1879-80); but he has also written: ‹History of the Four Georges› (1889), and his novels include: ‹Lady Judith› (1871); ‹A Fair Saxon› (1873); ‹Dear Lady Disdain› (1875); ‹The Right Honorable› (1886 with Mrs. Campbell-Praed). Later he has published ‹The Story of Gladstone's Life› (1897); ‹Modern England› (1898); and ‹Reminiscences› (1898). He enjoys a pension from the British government for his «services to literature.»

McCarthy, Justin Huntley, Irish journalist and author: b. 1860. He was graduated at University College and in 1884 was elected to Parliament. He has been a prolific and versatile author, following in the footsteps of his father Justin McCarthy (q.v.). Among his works are ‹Outline of Irish History› (1883); ‹Serapion, and Other Poems› (1883); ‹England Under Gladstone› (1884); ‹Camiola, a Girl with a Fortune› (1885); ‹History of the French Revolution› (1897); ‹The Proud Prince› (1903); ‹The Dryad› (1905). He has also written plays, such as ‹The Candidate›; ‹The White Carnation,› and ‹If I Were King.›

McCaul, mạ-kâl', **John,** Canadian scholar: b. Dublin, Ireland, 1807. He was elected president of Toronto University in 1849 and was interested for many years in educational matters in Canada. He edited Horace, Longinus, Lucian and Thucydides as college text-books, and among his valuable archæological works are ‹Britanno-Roman Inscriptions› (1863); and ‹Christian Epitaphs of the First Six Centuries.›

MacCauley, mạ kâl'ĭ, **Clay,** American Unitarian clergyman and author: b. Chambersburg, Pa., 8 May 1843. He was graduated at Princeton in 1864, and at the Theological Seminary of the Northwest, Chicago, in 1867, and read philosophy and divinity at Heidelberg, 1872. In the Civil War, 1862-3, he was a lieutenant in the 126th Pennsylvania regiment, and served on the staff of Gen. S. D. Sturgis, and in 1864-5 was a member of the Christian Commission in the United States army. In 1880-1 he was a collaborator of the Bureau of Ethnology among Indians east of the Mississippi. Entering the Unitarian ministry, he was pastor of the First Church, Waltham, Mass., 1869-72, and of All Souls Church, Washington, D. C., 1876-81. From 1890 to 1900 he served as director of the Japan mission of the Unitarian Association, and from 1891 to 1899 was president of the College for Advanced Learning at Tokyo and professor there of philosophic and historic theology. He has written: ‹Christianity in History› (1891); ‹The Religious Problem of Japan — How Solve It?› (1894); ‹Introductory Course in Japanese› (1896); ‹Japanese Literature› (1899); ‹A Day in the Very Noble City, Manila› (1899); and has published ‹Single Songs of a Hundred Poets› (1899) and other translations from the Japanese.

McCausland's Raid, an incursion of the Confederate general McCausland into Maryland and Pennsylvania, the chief incident of which was the burning of Chambersburg, Pa. Gen. Early having defeated Gen. Crook in the battle of Kernstown (q.v.), 24 July 1864, and driven him and Averell across the Potomac at Williamsport, ordered Gen. McCausland with his brigade and that of Bradley T. Johnson, with four guns, in all about 2,500 men, across the Potomac to raid Pennsylvania and then move to Cumberland, Md., to destroy the machinery of the Cumberland coal-pits and the repair-shops, stations, and bridges of the Baltimore & Ohio Railroad. Early says he wished to open the eyes of the people of the North to the enormities of its armies, by an example in the way of retaliation, and that Chambersburg, Pa., was selected as the town on which retaliation should be made. The sum of $100,000 in gold, or $500,000 in currency was to be demanded of it, in default of which McCausland was ordered to burn the town. Under cover of demonstrations at Williamsport and other points along the Potomac, McCausland crossed the river at McCoy's Ferry, near Clear Spring, above Williamsport, on the 29th, and made straight for Chambersburg, about 25 miles northeast. He met with but little opposition and, on the morning of the 30th, rode into the fated town and demanded the sum fixed by Early. It could not immediately be raised; he knew that Gen. Averell was close upon him; and setting fire to the place, laying a greater part of it in ashes, he hastily marched westward to Mc-

Connellsburg and encamped. Averell, who was in Hagerstown when he heard that McCausland had crossed the Potomac, started in pursuit with about 2,600 cavalry, went through the burning town and, a few miles from McConnellsburg, struck McCausland's rear, diverting him from his intended march on Bedford and forcing him back to the Potomac at Hancock, which was reached by noon of the 31st. Here McCausland formed for battle, but upon Averell's appearance and prompt attack he withdrew westward by the National road to Cumberland, where, 1 August, he found Gen. Kelley to oppose him, whom he attacked in the afternoon, and skirmished until night, when he retreated toward Old Town, on the Potomac, leaving 30 of his killed and wounded on the field. At Old Town he forced a crossing at daylight 2 August, capturing or dispersing a regiment of new troops from Ohio, and then moved south into the Valley of the South Branch of the Potomac, by way of Springfield and Romney. From Romney, 4 August, he moved on New Creek and attacked the garrison, but after a stubborn fight was respulsed, leaving 25 dead on the field, the Union loss being 36 killed and wounded. McCausland then withdrew to near Moorefield, where the South Fork joins the South Branch of the Potomac, and considering himself safe from pursuit, went into camp. Averell, who had remained at Hancock when McCausland drew off toward Cumberland, crossed the Potomac on the 4th, and, after a forced march through Bath, Springfield, and Romney, before sunrise of the 7th surprised McCausland in his camp and routed him, capturing his four guns, nearly all his wagons, several hundred horses, three battle-flags, many small arms, and 420 prisoners, including 38 officers. McCausland's loss in killed and wounded was about 100. Averell's loss was 41 killed and wounded. McCausland's shattered command fled to the mountains, and made its way in squads to the Shenandoah Valley, finally assembling at Mount Jackson. «This affair,» says Early, «had a very damaging effect upon my cavalry for the rest of the campaign.» Consult: ‘Official Records,’ Vols. XXXVII., XLIII.; Pond, ‘The Shenandoah Valley in 1864’; Early, ‘The Last Year of the War for Independence.’ E. A. CARMAN.

MacChes'ney, Clara T., American artist: b. Brownsville, Cal., 1861. She studied at the San Francisco Art School, at the Gotham Art School, New York, and at the Colarossi School in Paris. Her genre work has received favorable recognition. At the World's Columbian Exposition in 1893 she was awarded two medals and she received the Dodge prize, New York, in 1894. Since then she has also received three medals from the Colarossi School, a gold medal from the Philadelphia Art Club, and the second Hallgarten prize from the National Academy of Design, New York. At the Paris Exposition of 1900 she exhibited ‘Pomegranates’ and ‘The Old Blind Fiddler.’

McChesney, Dora Greenwell, American author: b. Chicago 1 Oct. 1871. She was privately educated, chiefly by her mother, in whose company she traveled and read widely, making special acquaintance with German literature, Italian art, and Roman antiquities, also becoming deeply interested in studying the English civil war, with characters and incidents of which her writings largely have to do. Among these are: ‘Kathleen Clare, Her Book, 1637–1641’ (1895); ‘Miriam Cromwell, Royalist: a Romance of the Great Rebellion’ (1897); ‘Beatrix Infelix: a Summer Tragedy in Rome’ (1898); ‘Rupert, by the Grace of God: the Story of an Unrecorded Plot’ (1899).

Macchiavelli, Niccolo. See MACHIAVELLI, NICCOLO.

McClellan, mạ-klĕl'ạn, **George Brinton**, American soldier: b. Philadelphia 3 Dec. 1826; d. Orange, N. J., 29 Oct. 1885. He was educated at the University of Pennsylvania and at West Point where he was graduated in 1846. He was brevetted 2d lieutenant of engineers, and immediately ordered to Mexico, where as lieutenant of a company of sappers, miners, and pontoniers he rendered valuable service. He was at the siege of Vera Cruz, at Cerro Gordo, and in the attack on the City of Mexico; at Contreras and Churubusco he won the brevet of 1st lieutenant, and was brevetted captain for gallantry at Chapultepec. After the war he was ordered to West Point as captain of field labors and instructor in bayonet exercise. In 1851 he was ordered to Fort Delaware to superintend its construction. The next year he accompanied Capt. Randolph B. Marcy (later his father-in-law) on an expedition to explore the Red River, and in September 1852 was ordered as senior engineer to Texas, to survey the rivers and harbors of that State. In 1853 he was detailed for the examination of the western part of the proposed route for a Pacific railroad; and explored the Yakima pass and various portions of the Cascade range, and the most direct route to Puget Sound, his report forming the 1st volume of the ‘Pacific Railroad Surveys’ published by the government. He was soon afterward detailed to investigate the railroad system of the United States, with a view to obtain all the necessary data on construction, equipment, and management for the successful operation of the Pacific railroad. Of the result of his proceedings he presented a full report in November 1854. In March 1854 he was promoted to be captain in the 1st cavalry. In the spring of 1855 he was sent to Europe to study the organization of European armies, and observe the war in the Crimea. He wrote one volume of the report of this commission, which was republished in Philadelphia under the title of ‘The Armies of Europe’ (1861). He resigned his commission in January 1857, and was for three years vice-president and engineer of the Illinois Central Railroad, at the end of which time he became general superintendent of the Ohio and Mississippi Railroad, and two months later president of the eastern division of the same road. He held this office when the Civil War broke out in 1861. He then received a commission as major-general from the governor of Ohio and proceeded to organize the volunteers of the State; the States of Ohio, Illinois, Indiana, the western part of Pennsylvania and western part of Virginia were united to form the department of the Ohio under his command. About 1 June his army began to cross the Ohio River into Virginia; on the 18th McClellan himself left Cincinnati to take the field, and by the middle of July the whole northwestern part of the State had been cleared of Confederate troops and the Wheeling legislature left free to organize a loyal government.

lands of Cebu, Mactan, Baulayan and the Camotes.

McClernand, John Alexander, American lawyer: b. Breckinridge County, Ky., 30 May 1812; d. Springfield, Ill., 20 Sept. 1900. He was admitted to the Kentucky bar in 1832, but in the same year volunteered for military service against the Sac and Fox Indians. Five years later he was elected to the Illinois legislature, and subsequently sat for two terms in Congress. During the Civil War he served with distinction at the battle of Fort Donelson as brigadier-general of volunteers, and was promoted major-general. He led a division at the battle of Shiloh, relieved Sherman before Vicksburg in 1863 and was in command of the 13th Army corps until 1864, when he resigned. In 1870 he was appointed circuit judge for the Sangamon, Ill., district. He presided at the National Democratic convention in St. Louis, 1876, and was appointed by President Cleveland member of the Utah Commission.

McClintock, mạ-klĭn'tŏk, **Emory,** American actuary: b. Carlisle, Pa., 19 Sept. 1840. He was graduated from Columbia University in 1859, and afterward took special studies in chemistry. He was consular agent at Bradford, England, 1863–6, actuary of the Asbury Life Insurance Company, New York, 1867–77, and of the Northwestern Mutual Life Insurance Company, Milwaukee, 1871–89. Since the last named date he has been actuary of the Mutual Life Insurance Company, New York. He has contributed to mathematical journals.

McClintock, Sir **Francis Leopold,** English admiral: b. Dundalk, Ireland, 1819. He entered the British navy in 1831 and was commissioned lieutenant in 1845. He sailed on four Arctic voyages, being sent out in 1848 to search for Sir John Franklin, and again in 1850 and 1852, without discovering any traces of the explorer. In 1857 he renewed the search as commander of the Fox and brought back documentary and other evidence of Franklin's death. For his services as an Arctic explorer he was knighted in 1860, and in 1844 made admiral. His ‹Voyage of the Fox› has gone through several editions.

McClintock, John, American scholar: b. Philadelphia, Pa., 27 Oct. 1814; d. Madison, N. Y., 4 March 1870. He was joint editor and compiler with James Strong of the ‹Cyclopedia of Biblical, Theological and Ecclesiastical Literature› which goes by their name, the last volume of which was published in 1895. Among his other works are ‹An Analysis of Watson's Theological Institutes› (1850); and ‹Temporal Power of the Pope› (1853). For the last three years of his life he was president of the Drew Theological Seminary.

McCloskey, mạ-klŏs'kĭ, **John,** American Roman Catholic prelate: b. Brooklyn, N. Y., 20 March 1810; d. New York 10 Oct. 1885. His secondary and collegiate studies were made at Mount Saint Mary's College, Emmitsburg, Md., and his post-graduate studies in France and Rome. At 24 he was ordained priest and on returning to America was assigned to Saint Joseph's Church, New York city. When Saint John's College, at Fordham (now a part of New York city), was opened in 1841, he was made its first president, but in the next year he returned to parish work. In 1844 he was appointed coadjutor to Bishop Hughes of the diocese of New York, and consecrated titular bishop of Axieren; and three years later was appointed bishop of Albany, a diocese just created from a part of the diocese of New York. For 17 years he worked for the upbuilding of the Albany diocese, and the good of his people. He built the Cathedral of the Immaculate Conception at Albany, Saint Joseph's Theological Seminary at Troy, established several new parishes, and founded educational and charitable institutions, including hospitals, orphanages, homes for the aged, and reformatories. He succeeded Archbishop Hughes in the archiepiscopal see of New York, 6 May 1864. The result of his labors in the archdiocese of New York remains his greatest monument. He was made a cardinal in 1875, under the title of Santa Maria supra Minervam. He was in attendance at the Vatican Council (q.v.) and a member of the committee on discipline. He was summoned to Rome February 1878 to attend the conclave for the election of a pope but was too late to cast a vote, Leo XIII. having been elected a few hours before his arrival. Cardinal McCloskey was noted for his gentleness, firmness, profound scholarship, and great executive ability.

McCloskey, William George, American Roman Catholic prelate: b. Brooklyn, N. Y., 10 Nov. 1823. Upon completing his studies at Mount Saint Mary's College, Emmitsburg, Md., he turned his attention to law, but subsequently changing his mind, entered Saint Mary's Theological Seminary, where he pursued a six years' course in philosophy and theology, being ordained priest 6 Oct. 1852. His first appointment was as assistant in the Church of the Nativity. In 1853 he was named professor of Latin and Sacred Scriptures in Mount Saint Mary's College and in 1857 became director of the theological seminary. When the American College was formally opened in Rome Pope Pius IX. chose Dr. McCloskey its first president, 8 Dec. 1859, a position which, for eight years, he filled to the utmost satisfaction. In 1865 he visited America in the interests of the institution under his charge and succeeded in collecting funds sufficient for its permanent endowment. Upon the death of Bishop Lavialle, Pope Pius IX. appointed Dr. McCloskey to the see of Louisville, Ky., and he was consecrated at Rome 24 May 1868. During his 36 years' administration numerous churches, schools and religious institutions have been built throughout his diocese, which now (1905) has a Catholic population of about 100,000; 169 priests; 143 churches; 58 parochial schools and 4 orphanages, besides hospitals, infirmaries, academies, etc.

McClure, mạ-kloor', **Alexander Kelly,** American journalist: b. Sherman's Valley, Perry County, Pa., 9 Jan. 1828. He was reared on a farm, educated at home, and apprenticed to a tanner in 1842, soon after began to write for the Perry *Freeman,* and edited and published the *Juniata Sentinel* at Mifflin, Pa., in the Whig interest, 1846–50. He then published (1850–6) the Chambersburg *Repository,* which he made influential in the cause of anti-slavery. He was State superintendent of printing in 1855; a member of the State convention of 1855 which met

McCook, Anson George, American soldier and politician: b. Steubenville, Ohio, 10 Oct. 1835. He took part in the Civil War as captain in an Ohio regiment, and was colonel of a regiment in the Army of the Cumberland. At the end of the war he was brevetted brigadier-general. In 1873 he was elected from New York as a Republican member of Congress, and became secretary to the United States Senate from 1887 to 1889, and city chamberlain of New York from 1893 to 1897.

McCook, Daniel, American soldier: b. Canonsburg, Pa., 20 June 1798; d. near Buffington's Island, Ohio, 21 July 1863. Having received a college education, he removed from Pennsylvania to Ohio and settled at Carrollton. Although 63 years old at the outbreak of the Civil War, he entered the Union army, in which he served as major of volunteers. During one of the Morgan raids (q.v.) he received a wound from which he died shortly after. Eight sons of his served as officers in the Federal army, three of whom were killed in battle.

McCook, Henry Christopher, American clergyman and entomologist: b. New Lisbon, Ohio, 3 July 1837. He was graduated at Jefferson College (now Washington and Jefferson) in 1859, studied at the Western Theological Seminary, and in the Civil War he served as 1st lieutenant and chaplain in the 41st Illinois regiment, 1861–2. In 1862–3 he was minister of a church at Clinton, Ill.; from 1863 to 1870 labored in St. Louis as a home missionary; and subsequently became pastor of the Tabernacle Presbyterian Church in Philadelphia, a charge he still retains. He served as chaplain of the 2d regiment of Pennsylvania volunteers in the Spanish-American war, and is chaplain of the Pennsylvania Commandery of the Loyal Legion, president of the American Entomological Society, vice-president of the Academy of Natural Sciences, Philadelphia, and president of the American Presbyterian Historical Association. His writings include: 'The Gospel in Nature'; 'The Mound-Making Ants of the Alleghanies' (1877); 'The Agricultural Ants of Texas' (1879); 'Honey Ants and Occident Ants' (1882); 'Tenants of an Old Farm' (1884); 'The Women Friends of Jesus' (1885); 'American Spiders and Their Spinning-Work' (1889–93); 'The Latimers, a Scotch-Irish Historic Romance of the Western Insurrection' (1898); and 'Martial Graves of Our Fellow Heroes in Santiago de Cuba.' See article on SPIDERS by Dr. McCook in this encyclopedia.

McCook, Neb., city, county-seat of Red Willow County; on the Republican River, and on the Burlington & Missouri River Railroad; about 230 miles west by south of Lincoln, the capital of the State. It is in a rich agricultural region. McCook owes much of its prosperity to the fact that it is the headquarters of a railroad division, and has railroad shops. The sugar beet, alfalfa, wheat, and corn are the principal productions of the surrounding farms. A number of cattle are raised and a large number of live stock from Willow County and vicinity is shipped from McCook. Pop. (1900) 2,445.

McCormick, ma-kôr'mĭk, **Alexander Hugh,** American naval officer: b. in the District of Columbia, 9 May 1842. He was acting midshipman at the United States Naval [illegible] 1859; in April 1861 entered into act[illegible] and served in blockading squadrons [illegible] throughout the Civil War. He became captai[illegible] Since the Civil War he has perform[illegible] sea duties, and has served in the department of mathematics and in that of astronomy and navigation at the Naval Academy. He was inspector of ordnance, 1876–81; made a cruise around the world, 1881–5; was assigned to the ordnance department, 1885–92; to the Asiatic stat[illegible] was captain of the Norfolk Navy-Y[illegible] member of the armor and pers[illegible] 1897–8; and commandant of the [illegible] Navy-Yard in 1898. In 1899 he [illegible] the rank of rear-admiral, and w[illegible] March 1900.

McCormick, Cyrus Hall, [illegible] ventor and manufacturer: b. [illegible] 1809; d. Chicago 13 May 1884. [illegible] from his native State to Cincinnat[illegible] two years later went to Chicago. [illegible] invented an improved reaping-ma[illegible] was patented and further improv[illegible] brought him great wealth and wor[illegible] with many decorations, medals, [illegible] tributed liberally in 1859 to the [illegible] of the Presbyterian Theological [illegible] the Northwest, in Chicago. He al[illegible] chair in Washington and Lee U[illegible] ginia.

McCormick, Leander James, [illegible] ventor: b. in Virginia 1819; d. Ch[illegible] 1900. In early life he worked w[illegible] in manufacturing reaping-machine[illegible] Chicago in 1848, and entered int[illegible] with his brother, Cyrus Hall McC[illegible] and superintended the manufact[illegible] ment of their reaping-machine pla[illegible] until 1879, when the firm was incorporated as the McCormick Harvesting-Machine Company. Ten years later he retired from active business. Many of the improvements in the famous McCormick reaping-machine were made by him. In 1871 he gave an observatory with a powerful telescope to the University of Virginia.

McCormick Observatory, an astronomical station connected with the University of Virginia, near Charlottesville, Va. The funds for the construction of the observatory were principally the gift of Leander J. McCormick, and it was built in 1883–4. The principal instrument is an equatorial of 26 inches aperture, a companion instrument to the Washington 26-inch, both being the work of Alvan Clark & Sons, of Cambridgeport, Mass. The position of the observatory is lat. 38° 2′ 1.2″ N.; lon. 5° 14′ 5.2″ W.

McCormick Theological Seminary, in Chicago, Ill.; opened in 1830, under the auspices of the Presbyterians, as a department of Hanover Academy, at Hanover, Ind. Ten years after its opening, the school was removed to New Albany, Ind. Cyrus H. McCormick (q.v.) offered the institution a liberal endowment, which generous gift caused the removal of the school to Chicago, in 1859. It was for a time known as the Presbyterian Theological Seminary of the Northwest. In 1886 the present name was taken in honor of its liberal benefactor. No fees are charged for lodging or tuition, and some of its income is used in assisting worthy and needy students. In 1903 there were con-

South Carolina for the whole war, he entered the Confederate army, 27 June 1861, was made major and then lieutenant-colonel, was badly wounded at the second battle of Bull Run (or Manassas), 30 Aug. 1862, and in January 1863 received an injury in camp from a falling tree, in consequence of which he was transferred from field service to the command of a camp of instruction at Madison, Fla., in 1864. He remained at that post until the end of the war. Later he became major-general of State troops and a member of the South Carolina legislature (1880–90). Among his more important writings may be mentioned: ‘The History of South Carolina Under the Proprietary Government, 1670–1719’ (1897); ‘The History of South Carolina Under the Royal Government, 1719–1776’ (1899); ‘The History of South Carolina in the Revolution, 1775–1780’ (1901); and ‘The History of South Carolina in the Revolution, 1780–3’ (1902).

McCrary, mạ-krā′rĭ, **George Washington,** American lawyer; b. Evansville, Ind., 29 Aug. 1835; d. St. Joseph, Mo., 23 June 1890. His parents removed with him in 1836 to that part of Wisconsin Territory which is now the State of Iowa. He received a public school education, studied law, was admitted to the bar in 1856 and began practice in Keokuk, where he soon became prominent. Elected to the State legislature in 1857 he became State senator in 1861–5, and member of Congress 1868–77. In Congress introduced the law under which the judiciary of the United States was reorganized; proposed appointment of joint committee to count electoral vote in Hayes-Tilden controversy; was prominent in furthering passage of Electoral bill. He served on committees on revision of laws, naval affairs, and judiciary; was secretary of war under President Hayes 1876–9 and was judge of the 8th judicial district in 1879–84. He then resigned and settled in Kansas City, Mo., where he became general consulting attorney of the Atchison, Topeka and Santa Fe Railroad Company. He was the author of ‘American Law of Elections’ (1875).

McCrea, mạ-krā′, **Jane,** American woman: b. Bedminster (now Lamington), N. J., 1753; d. near Fort Edward, N. Y., 27 July 1777. She was the daughter of a Scotch Presbyterian clergyman at whose death she went to live with her brother near Fort Edward, N. Y. At the commencement of the Revolution she was betrothed to David Jones, an officer of the crown. When Burgoyne's army was advancing from the north she was visiting a Mrs. MacNeil at Fort Edward. Her brother, sharing the general alarm felt throughout the region, sent for his sister, intending to remove to a safer locality. On the morning fixed upon for her departure, a band of Indians in the employ of Burgoyne suddenly swooped down upon the MacNeil household and they, together with Miss McCrea, were made prisoners. Mrs. MacNeil and her party arrived in safety at Burgoyne's camp, but half an hour later another party of Indians arrived, bearing a number of freshly severed scalps, one of which bore the long glossy hair of Miss McCrea, whose body was later found by a roadside. The precise manner of her death never became known. The Indians claimed that she was killed by a random shot from an American detachment, whereupon her captors determined to secure the reward for her scalp. It has been surmised that a quarrel arose among the Indians as to whose captive she was and that one of them in a frenzy tomahawked her. Other authorities credit the story that Lieutenant Jones hired the Indians to bring his betrothed to camp where they were to be married and that she was killed in a controversy which arose as to whose captive she was. Lieutenant Jones denied this story; he lived to old age, a morose and gloomy man. At all events the tragedy caused a general feeling of horror throughout America and England. Burgoyne called a council of his Indian chiefs in order to reprove them, but as his allies would have deserted him the offender was allowed to go unpunished. A blasted pine long marked the spot where tradition relates that the beautiful young girl was murdered, and her grave may be seen in a small cemetery near the ruins of Fort Edward.

McCreary, mạ-krē′rĭ, **James Bennett,** American lawyer: b. Madison County, Ky., 8 July 1838. He was graduated at Centre College, Danville, Ky., in 1857, and from the Law School of Cumberland University, Tenn., 1859. He entered the Confederate army in 1862 as major of cavalry, and served until close of war. He was a member of the Kentucky House of Representatives in 1869, 1871, and 1873 (being Speaker 1871–3); governor of Kentucky 1875–79, and a member of Congress in 1885–97. He was a delegate to the International Monetary Conference at Brussels, Belgium, in 1891, and in 1903 became United States Senator.

McCree′ry, James, American merchant: b. Ireland; d. Aiken, S. C., 1893. He came to the United States when about 20 and engaged in the dry goods business in Baltimore, and at the beginning of the Civil War removed to New York, where he soon established a business of his own which made him ultimately one of New York's leading merchants. He was a member of many public boards, one of the founders of the silk industry in America, and director of numerous commercial enterprises. He was one of the Chamber of Commerce delegation sent to England two years before his death, and was a leading member of various clubs chiefly of an educational or public character.

McCulloch, mạ-kŭl′ō, **Benjamin,** American soldier: b Rutherford County, Tenn., 11 Nov. 1811, d. 7 March 1862. He became a skilled hunter and boatman, and joined other frontiersmen in settling Texas. In 1835 he served in the Texan war for independence, being in the battle of San Jacinto. He also commanded a company of rangers in the Mexican War under Taylor and Scott, did important work as a scout, and was specially distinguished at the battles of Monterey and Buena Vista, and in the siege of the City of Mexico. In 1853 he was appointed United States marshal in Texas. During the Civil War he served in the Confederate army, was appointed brigadier-general, and sent into Missouri, where he was defeated at the battle of Dug Spring, but later united his forces with those of General Price and then defeated the Federals under General Lyon (q.v.) at Wilson's Creek. He commanded a corps at the battle of Pea Ridge, Ark., where he was killed.

McCulloch, mạ-kŭl′ōʜ, **Hugh,** American financier: b. Kennebunk, Maine, 7 Dec. 1808; d. near Washington, D. C., 24 May 1895. He was

ıist becoming famous in the campaign He was special correspondent during ıish-American War, Chinese troubles, war. He has published in book form s by McCutcheon' (1903).

ın'iel, Henry Dickerson, American b. Monroe, Ga., 4 Sept. 1837. He was l from Mercer University, Macon, Ga., tted to the bar in 1856. He attended as the Georgia Secession Convention in l served in the Confederate Army until of the war, attaining the rank of major th Georgia infantry. In 1865 he was r of the Georgia Constitutional Con- His disability to hold office having oved in 1872 by the United States Con- served in the State legislature, 1873–4; e senator, 1874–83, and in 1883 he was overnor of Georgia, which office he for three years.

ɔnald, Alexander, American politi- Clinton County, Pa., 10 April 1832; d. Park, N. J., 13 Dec. 1903. He was at Lewisburg University, Pa., and to Kansas in 1857. At the outbreak of War he was active in raising troops Federal army, supporting three regi- his own expense for a time. He was Congress from Arkansas on the re- of that State to the Union.

ɔnald, Etienne Jacques Joseph Alex- tē-ēn zhäk zhō-zef äl-ěks-ändr mäk ᴅᴜᴄ ᴅᴇ Tᴀʀᴇɴᴛᴇ, French soldier: b. France, 17 Nov. 1765; d. Courcelles, 4 Sept. 1840. He served in the French n as Colonel, brigadier-general, and ınd in 1798 was made governor of the tates, and of Naples in 1799. He was narshal of France for his services at 6 July 1809.

ɔnald, George, Scottish poet and b. Huntly, Aberdeenshire, 1824. He ated at Aberdeen University and at ɔllege, London, and entered the Inde- ministry, from which he retired and lay member of the English Church and literature as his profession. Macdon- k comprises poetry, novels, religious, nile books and is marked by deep re- eling and devotion to lofty ideals of novels deal chiefly with Scottish char- scenery. The best-known of his many : 'David Elginbrod' (1862); 'Alec Howglen' (1865); 'Annals of a Quiet hood' (1866); 'Robert Falconer,' his (1868); 'The Miracles of Our Lord' 'The Marquis of Lossie' (1877).

ɔnald, Sɪʀ Hector, British general: b. 1853; d. Paris, France, 25 March 1903. e enlisted and served in the ranks nine e was with Sir F. Roberts at Cabul, ɪrilliant service at Candahar was made ıant. He served in the Boer war of was captured at Majuba Hill. He ɔicuous for bravery at Suakim in 1888; ıe capture of Takar in 1891; and was command of the forces in Egypt, He was in command at Magersfontein and was then transferred to South where he commanded the Highland 1899–1901. He was made K.C.B. and was placed in command at Ceylon. Summoned home in 1903 on a charge of immoral conduct, he went to a hotel in Paris and committed suicide. The committee of inquiry reported (October 1903) that there was not a scintilla of evidence to substantiate the charges preferred against him and reported virtually that it was an instance of a proud, sensitive man assassinated by slander.

MacDonald, James Wilson Alexander, American sculptor: b. Steubenville, Ohio, 25 Aug. 1824. He studied in St. Louis and in New York. Among his works are statues of 'Joan of Arc'; 'Italia'; Edward Bates (1876) in Forest Park, St. Louis; Gen. Custer, at West Point; Fitz-Greene Halleck in Central Park, New York; an equestrian statue of Gen. Nathaniel Lyon; numerous busts, etc.

Macdonald, Sɪʀ John Alexander [illegible] statesman: b. Glasgow, Scotland, 1[illegible] d. Ottawa, Ont., 6 June 1891. In [illegible] he emigrated with his father to [illegible] twenty-one he was a practising [illegible] Kingston, Upper Canada, and in 1[illegible] elected to the Canadian Parliament f[illegible] stituency. While repudiating the na[illegible] throughout his career Macdonald wa[illegible] conspicuous figure in the Conservati[illegible] Canada. He became a cabinet minis[illegible] and, after various vicissitudes of [illegible] prime minister in 1857. Macdonald's [illegible] portant work is connected with the fe[illegible] Canada. The French and the Eng[illegible] inces, previously independent, had b[illegible] under one parliament in 1841, and [illegible] next twenty-five years each party an English and a French leader. [illegible] changed rapidly, and in 1864 there wa[illegible] lock. This made necessary some wi[illegible] and in that year a conference of dele[illegible] at Quebec to consider the federation North America. Directed largely by [illegible] ald's tact and resource this conference establishment of the Dominion of [illegible] 1867, under the British North Amer[illegible] passed by the British Parliament. [illegible] became the first prime minister of the [illegible] At first there were only four provinc[illegible] carried through successfully the negoti[illegible] which the Hudson Bay company ced[illegible] terests in the northwest to Canada; h[illegible] also the entrance of British Columbi[illegible] condition of building rapidly a transco[illegible] railway. During an election in 1872 M[illegible] accepted large sums for party purpo[illegible] Sir Hugh Allan, one of the chief proj[illegible] the Pacific railway, and in 1873 owing [illegible] «Pacific Scandal» he was forced to ret[illegible] office. In 1878 he again became prime with a policy of protection and he may [illegible] garded as the father of that system in [illegible] He remained prime minister until his [illegible] 1891. The confederation of Canada, the [illegible] sition by Canada of the Northwest, the [illegible] of the Intercolonial and the Canadian [illegible] railways, and the policy of protection [illegible] effected under Macdonald's lead. His intellect and ready wit made him a real [illegible] leader. In 1867 he was created K.C.B., [illegible] G.C.B., and on his death his widow was [illegible] Baroness Macdonald in her own right.

Gᴇᴏʀɢᴇ M. Wʀo[illegible]
Professor of History, University of Tor[illegible]

he was engaged in explorations in Arizona and Idaho for the United States government, and in 1893–9 was instructor in plant physiology at the University of Minnesota. He was appointed director of the laboratories of the New York Botanical Gardens in 1899. Among his books are: 'Nature and Work of Plants' (1900); 'Practical Text-book of Plant Physiology' (1902); etc.

McDougall, Alexander, American soldier: b. Island of Islay, Scotland, 1731; d. New York 8 June 1786. He emigrated with his father to America in 1755 and later became a merchant in New York. He devoted himself to the cause of the colonies and was imprisoned for a time. At the outbreak of the Revolution he enlisted in the American army, serving as colonel, brigadier-general, and in 1777 was promoted major-general. He commanded at White Plains and also attained distinction in the action at Germantown. He was elected member of the Continental Congress in 1781 and was for a time minister of marine. Re-elected in 1784–5 he served for a time and then resigned, preferring active service in the field. He was a member of the New York State senate at his death.

McDougall, Walter Hugh, American artist: b. Newark, N. J., 10 Feb. 1858. He attended a military academy, and from the age of 16 was self-educated, beginning his artistic work in 1876. He entered upon a distinct career in 1884 by the introduction of newspaper illustration and cartooning in the daily press. His writings include 'The Hidden City' (1886); 'Number 11' (1890); 'History of Christopher Columbus' (1892); 'The Rambilicus and His Friends'; and 'A Marvellous Journey' (in the New York *World,* 1889).

MacDougall, William, Canadian journalist and statesman: b. Toronto 1822. He pursued a course of study at Victoria College, Cobourg; was admitted to the bar in 1847; in the following year established the 'Canada Farmer'; in 1850 founded the 'North American,' afterward united with the Toronto *Daily Globe,* for which he wrote until 1870. He was a member of the Executive Council, 1862–4, serving also as commissioner of the crown lands; provincial secretary, 1864–9; and acting minister of marine in 1866–7. In 1867 he became minister of public works, and was made lieutenant-governor of Rupert's Land, Northwest Territories, in 1869. In 1865–6, as chairman of a commission, he did efficient work for the extension of Canadian trade, and in 1873 represented Canada as special fisheries commissioner in London. He published 'Six Letters on the Amendment of the Provincial Constitution' (1872).

MacDow'ell, Edward Alexander, American composer: b. New York city 19 Dec. 1861. He was educated at the Paris Conservatory and in Germany, and in 1881 was head of the Darmstadt Conservatory, his specialty being the pianoforte and composition. He resigned his position in 1884 and in 1896 was appointed professor of music at Columbia University. In 1896–8 he was director of the Mendelssohn Glee Club of New York and in 1897–8 president of the American Society of Musicians. He is well-known as a pianist and his work as a composer is justly famous. His compositions are marked for their delicate charm, their beauty of expression and poetry of movement, and include concertos, sonatas, symphonies, songs, and pianoforte pieces, among which are: 'Woodland Sketches'; 'Forest Idylls'; 'Lancelot and Elaine'; etc.

McDowell, Irvin, American soldier: b. near Columbus, Ohio, 15 Oct. 1818; d. San Francisco, Cal., 5 May 1885. He studied in France and was graduated from West Point in 1838. During the Canadian troubles he was stationed on the Niagara and on the Maine frontiers, and in 1841 served at West Point as assistant instructor in tactics, becoming adjutant in 1845. In 1845 he went to Mexico as aide-de-camp to Gen. Wood and for gallant conduct at Buena Vista in 1847 was promoted brevet captain, shortly afterward attaining the rank of assistant adjutant-general. Subsequently he was stationed at the War Department in Washington and in 1856 was raised to the rank of brevet-major. He was on Gen. Wood's staff at the outbreak of the Civil War and assisted in inspecting and organizing the volunteer troops at Washington. In May 1861 he was made brigadier-general of the volunteers and given command of the Army of the Potomac. Constrained by the impatience of the North, McDowell moved in July to meet the enemy and despite his carefully laid plan met a disastrous defeat at Bull Run, 21 July 1861, owing to the imperfect organization of his raw recruits. Shortly after McClellan was given command of the army and McDowell was retained at the head of one of its divisions. In 1862 he was promoted major-general of volunteers and placed in command of the First corps, which became the Army of the Rappahannock, stationed to guard Washington. In August 1862 he received command of the Third corps of the Army of Virginia and fought under Gen. Pope at the battles of Cedar Mountain, Rappahannock Station, and the second battle of Bull Run, where he performed especially good service. He was removed from the field in September 1862. Considering this action of the War Department a direct reflection upon his military services, he asked for an investigation, the result of which was favorable to him. In July 1864 he was placed in command of the Department of the Pacific Coast, and in March 1865 was made brevet major-general in recognition of his gallant services at Cedar Mountain. In 1872 he succeeded Gen. Meade as major-general in the regular army. The last years of his life were spent in California.

McDowell, James, American politician: b. in Rockbridge County, Va., 1796; d. 1851. He was graduated at Princeton in 1817; in 1831 was elected to the Virginia legislature; was governor of that State, 1842–4, and from 1847 to 1851 represented it in Congress. He favored the gradual abolition of slavery, although advocating the claims of State rights. As orator and debater in Congress he bore a prominent part in the proceedings of that body.

McDowell, Battle of. When Gen. Banks marched up the Shenandoah Valley from Winchester to Strasburg and Harrisonburg in April 1862, Gen. Jackson fell back and took position at Swift Run Gap in the Blue Ridge, on the 19th. Banks occupied Harrisonburg on the 26th where he was stopped by President Lincoln's order, and 1 May was ordered back to Strashis best known work, 'Contes de Petit-Chateau' (1862), called in the English translation 'Home Fairy Tales'; 'History of a Mouthful of Bread' (1861); 'Servants of the Stomach' (1866); 'France Before the Franks' (1881).

Mace, an aromatic spice made from the arillode or false aril which covers the seed of a nutmeg (*Myristica fragrans*). The yellow external covering of the nutmeg (q.v.) being removed, the red, rather fleshy, arillode which partially conceals the nutmeg is encountered. After drying in the sun for several days this becomes more or less translucent and usually orange yellow and waxy. In this form it is largely exported from the Spice Islands, where it is native, and from the West Indies, where it has been introduced into cultivation. The powerful but agreeable nutmeg-like odor and flavor characteristic of it are due to a volatile oil which is obtained by distillation for use in perfumery and culinary articles. A buttery fixed oil obtained by expression is used after the admixture of the volatile oil under the names nutmeg balsam and nutmeg butter. White mace is obtained from *M. otoba* and red mace from *M. tingens;* also a low grade from *M. fatua,* but this is rarely found in the market. Mace is also largely used whole or ground in cookery.

Mace, a weapon of war formerly in use in Europe, chiefly among the cavalry, as late as the 16th century, and still used among savage tribes. It consists merely of a staff about five feet long, with a knob at the end made of iron or some other heavy substance. The knob was sometimes covered with spikes. In England the mace is used as an emblem of the officers of state, before whom it is carried. It is made of the precious metals, or of copper, gilt, and ornamented with a crown, globe, and cross.

Macedo, Joaquim Manuel de, hō-ā-kēn' mä'noo-el dā mä-sä'dō, Brazilian poet, novelist, and statesman: b. province of Sao João d'Itaborahi 24 June 1820; d. Rio de Janeiro 11 April 1882. He studied medicine, but presently began to write and became professor of national history in the College of Rio Janeiro. He was one of the most prominent of Brazilian authors in the 19th century, and being keenly interested in politics was elected to the Brazilian Chamber in 1854. His works include: 'Moreninha,' a novel (1844; 5th ed., revised, 1877); 'O Moço Loura,' a novel of the early stages of the Portuguese conquest (1845); 'O Dous Amores' (1848); 'Vicentina' (1853); 'A Nebulosa,' a poem (1857), his greatest work, consisting of six cantos in unrhymed hendecasyllables; 'Cotie,' a drama; 'Fantasma Branco,' a comedy (1856); 'Corógraphia do Brasil' (1873); etc.

Macedonia, măs-ę-dō'nĭ-ạ, Turkey, an ancient monarchical territory now comprised in the Turkish vilayets or provinces of Monastir and Salonika, and inhabited by a turbulent, heterogeneous population of Turks, Greeks, Bulgarians, Servians, Wallachians, Albanians, and Jews. Its earliest name was Emathia, which remained the name of the district between the Haliacmon and the Axius, two rivers falling into the Thermaic Gulf, now the Gulf of Saloniki. This district was the earliest seat of the Macedonian monarchy. There was also an older form of the name Macedonia, namely Macetia, whence the Macedonians were sometimes called Macetæ, even after the name Macetia had come to be disused. In the time of Herodotus the name Macedonia was applied only to the district situated south and west of the Lydias, another river which falls into the Thermaic Gulf, and which flows between the two already mentioned. Philip of Macedonia extended his kingdom as far as the Lake of Lychnitis, in Illyria, in the west, Mount Scardus and Mount Orbelus in the north (so as to include the whole of Pæonia), and the River Nestus on the northeast. He added also the peninsula of Chalcid[illegible] part which he conquered from Thrace [illegible] tween the Strymon and Nestus, [illegible] *Macedonia adjecta.* The provinces o[illegible] nia were, in general, known by name [illegible] time of Herodotus. In the time of Pl[illegible] were 19. Macedonia was inhabited by two different races — the Thracians, to whom belonged the Pæonians and Pelagonians, and the Illyrians. The language of the southern Macedonians shows that there must have been a large admixture of Dorian settlers among them. *Pliny* speaks of 150 different tribes who dwelt *here at* an early period. They were divided into *several* small states, which were incessantly at war [illegible] the Thracians and Illyrians, till *Philip* a[illegible] ander gave the ascendency to *one,* and [illegible] the most powerful in the *world. The* [illegible] these princes, who came to the throne [illegible] B.C., taking advantage of the *strength* [illegible] country and the warlike disposition of [illegible] habitants, reduced Greece, which was d[illegible] by internecine broils, in the battle of Ch[illegible] 338 B.C. His son, Alexander, subdued A[illegible] by an uninterrupted series of victories [illegible] successive years made Macedonia in a sh[illegible] the mistress of half the world. After hi[illegible] this immense empire was divided. M[illegible] received anew its ancient limits, and [illegible] eral battles lost its dominion over Gre[illegible] alliance of Philip V. with Carthage d[illegible] second Punic war gave occasion to t[illegible] trophe. The Romans delayed their rev[illegible] a season; but when Hannibal was c[illegible] they sent over T. Quintius Flamini[illegible] defeated Philip at the battle of Cyno[illegible] (197 B.C.), and compelled Philip to [illegible] peace, which was only granted upon *his* [illegible] to acknowledge the independence *of* G[illegible] surrender his vessels, to reduce *his* arm[illegible] men, and defray the expenses of the w[illegible] seus, the successor of Philip, having [illegible] arms against Rome, was totally defeated [illegible] by Paulus Æmilius, 168 B.C., and the [illegible] took possession of the country. Indignan[illegible] acts of oppression, the Macedonian nob[illegible] the whole nation rebelled under Andris[illegible] after a long struggle they were over[illegible] Quintus Cæcilius Macedonicus; the nobil[illegible] exiled, and the country became a Rom[illegible] vince, 148 B.C. As such it is mentioned [illegible] New Testament, and St. Paul's letters [illegible] Thessalonians and Philippians are addre[illegible] Macedonian Christians. In 395 A.D., af[illegible] dissolution of the Roman Empire, Maced[illegible] came part of the Byzantine Empire. I[illegible] under Turkish domination in the 15th [illegible] While the name has no modern territor[illegible] nificance, it has come into considerable [illegible] prominence in connection with the con[illegible] nationalities in European Turkey, among [illegible] the only object in common is a desire to [illegible] off Turkish rule, the Bulgarians there d[illegible] to be governed from Sofia, the Servian [illegible] rebellion in Cuba in 1895, when he at once joined the insurrectionary army. He raised a large force which he commanded with signal success at Jobito and later was victorious over Canellas at Sao del Indio. He was killed in a furious engagement at La Lama del Gata in which the Cubans were finally victorious.

Macerata, mā-chā-rä'tä, Central Italy, (1) an episcopal city, capital of the province of the same name, picturesquely situated on an eminence 1,207 feet high, between the Apennines and the sea, 21 miles south of Ancona. It is encircled by walls, pierced by six gates, has a cathedral, provincial palace, and theatre on the central public square, a college founded in 1290, museum, etc. Pop. of commune (1901) 22,784. (2) The province has an area of 1,087 square miles, is generally mountainous, but well wooded, and on its lower slopes produces much corn, fruit, and hemp, and rears great numbers of sheep and cattle. Pop. (1901) 259,429.

MacFad'den, Bernarr Adolphus, American editor and athlete: b. near Mill Springs, Mo., 16 Aug. 1868. He is editor and proprietor of 'Physical Culture,' and of 'Macfadden's Physical Development,' and 'Beauty and Health' (monthly magazines), etc. From 1890 to 1893 he was an athlete of some prominence in the wrestling arena, and he has invented various devices for physical exercise. Among his many publications are: 'The Athlete's Conquest'; 'The Strenuous Lover' (a physical-culture novel); 'Macfadden's Physical Training'; 'The Virile Powers of Superb Manhood'; 'Strength From Eating'; 'Fasting, Hydropathy, and Exercise'; 'Strong Eyes'; 'Physical Culture Cook-Book'; 'Power and Beauty — Superb Womanhood'; etc.

MacFar'ren, Sir George Alexander, English composer: b. London, England, 2 March 1813; d. there 31 Oct. 1887. He was educated at the Royal Academy of Music, where in 1837 he became a professor of symphony and harmony, and in 1875 principal. In the same year he was elected professor of music in Cambridge University. Among his compositions are the operas 'The Devil's Opera' (1838); 'Robin Hood' (1860); and the oratorios 'St. John the Baptist' (1873); 'King David' (1883); etc. He also wrote several valuable treatises: 'Harmony' (1860); 'Counterpoint' (1869); etc. He was knighted in 1883. After 1860 he was blind and his wife wrote his compositions from his dictation.

McFaul, măk-fâl', **James Augustine**, Roman Catholic prelate: b. near Larne, County Antrim, Ireland, 6 June 1850. He was educated at the College of Saint Francis Xavier, New York, and Seton Hall, South Orange, N. J., where he was graduated in 1873. He was pastor of churches at Long Branch, N. J., 1883–90; chancellor of the diocese of Trenton, 1890–2; vicar-general, 1892–4; and on the death of Bishop O'Farrell was appointed to succeed him, being consecrated bishop of Trenton in October 1894. He is widely known in connection with the reorganization of the Ancient Order of Hibernians, the establishment of the Federation of American Catholic Societies, and has published noteworthy articles and addresses on 'American Citizenship.'

McFingal, măk fĭng'gal, a polit
in verse by John Trumbull, 1774–82.
aims to give in Hudibrastic verse a
count of the Revolutionary War, an
ous description of the manners and
the time, satirizing the follies and e
of the author's own Whig Party as
of the British and Loyalists. M
Scotchman who represents the T
rius being the representative and
the patriotic Whigs. The first ca
lished in 1774, and the poem fin
complete in four cantos in 1782.
now comparatively unknown, but
at the time of its issue was ver
more than 30 pirated editions in
other forms were printed. It co
couplets famous at the time, some
still quoted. Two that are perhaps the most famous, and are often attributed to Samuel Butler, the author of 'Hudibras,' are —

> "No man e'er felt the halter draw
> With good opinion of the law;"

and

> "But optics sharp it needs, I ween,
> To see what is not to be seen."

McFlimsey, măk-flĭm'zĭ, **Flora**, the heroine of the once famous poem 'Nothing to Wear,' by William Allen Butler (q.v.). It was published in 1857 and became immediately popular.

McGaf'fey, Ernest, American poet and critic: b. in Ohio, August 1861. For several years he was a contributor in prose and verse to Chicago newspapers, and afterward became critic on the Saturday literary edition of the Chicago *American*, then private secretary to Carter H. Harrison, mayor of Chicago. He has published 'Poems of Gun and Rod' (1892); 'Poems' (1895); 'Poems of the Town' (1900); and 'Sonnets to a Wife' (1901).

McGahan, ma-găn', **Barbara Elagine**, («Vlad Kashirin»), Russo-American journalist: b. near Tula, Russia, April 1850. She was graduated from the Tula Female Seminary in 1866 and was correspondent for several leading journals in Russia, being sent as special correspondent to the United States in 1870, where she was married to J. A. MacGahan (q.v.). Since then she has been correspondent for many important newspapers of the United States and Russia, and through her contributions to various magazines her name has become widely known. She has made translations into Russian of several American works and has published in English a novel entitled 'Xenia Repnina' (1889).

MacGahan, Januarius Aloysius, American journalist and war correspondent: b. near New Lexington, Ohio, 12 June 1844; d. Constantinople 9 June 1878. He followed different callings in Western States, then went to Europe and studied law in Brussels. Upon the outbreak of the Franco-German war in 1870 he went to the field as correspondent of the New York *Herald*, and thenceforth devoted himself to journalism. In 1873, after heroic exertions, with extreme hardships, he reached the Russian army before Khiva and sent to the *Herald* reports of the campaign which won for him high admiration both here and in Europe, his account of the capitulation of the city being regarded as «a masterpiece of military journalism.» Returning to America, he went to Cuba to report on the Virginius affair, then to Spain, upon the Carlist uprising, where he spent 10 months with the army of Don Carlos, was captured by the Republicans, mistaken for a Carlist, condemned to death, and saved by the intervention of the United States minister. He then went to England, and in 1875 accompanied the Arctic expedition on the Pandora. In 1876 he joined the Turkish army, in the service of the London *Daily News*, and did memorable work in his description of the Bulgarian atrocities, his accounts standing approved before the world in face of all attempts to discredit them. In behalf of Bulgaria he appealed to Russia, was at the front in the Russo-Turkish war that followed, and was hailed as a chief instrument of Bulgaria's resulting independence. While nursing a friend he contracted a fever which in a few days caused his death. In 1884 the Ohio legislature secured the removal of his body from its foreign grave to its final resting-place at New Lexington. He wrote ‘Campaigning on the Oxus, and the Fall of Khiva’ (1874); ‘Under the Northern Lights’ (1876); and ‘Turkish Atrocities in Bulgaria’ (1876).

McGar'vey, John William, American educator: b. Hopkinsville, Ky., 1 March 1829. He was graduated at Bethany College, West Virginia, in 1850; for 12 years preached at Fayette and Dover, Mo., and in 1863 at Lexington, Ky.; and since 1865 has been professor of sacred history at the College of the Bible, Lexington. Of this college, a department of Kentucky University, he has been president since 1895. He is a clergyman of the Christian (Disciples) Church, and for 40 years has been connected with religious journalism. He has written: ‘Commentaries on the Acts of the Apostles’ (1863–93); ‘Commentaries on Matthew and Mark’ (1875); ‘Lands of the Bible’ (1881); ‘Text and Canon of the New Testament’ (1886); ‘Credibility and Inspiration of the New Testament’ (1891); ‘McGarvey's Sermons’ (1894); ‘Jesus and Jonah’ (1897); and ‘The Authorship of Deuteronomy’ (1902).

McGee, mạ-gē', **Anita Newcomb**, American physician: b. Washington, D. C., 1864. She is a daughter of Simon Newcomb (q.v.); was educated at Newnham College, Cambridge, England, at the University of Geneva, and at other institutions in Europe; also graduated in medicine at Columbian University, 1892, and took a post-graduate course in gynecology at the Johns Hopkins Hospital. From 1892 to 1896 she practised in Washington. In 1888 she married W J McGee (q.v.). She has held prominent positions in the National Society of the Daughters of the American Revolution, and from April to September 1898 was director of its Hospital Corps, which selected women nurses for army and navy. In August 1898 to December 1899 she was acting assistant surgeon in the United States army, being the first woman to hold such a position, and was assigned to duty in the surgeon-general's office, where she organized the army nurse corps.

McGee, Thomas D'Arcy, Canadian journalist and politician: b. Carlingford, Ireland, 13 April 1825; d. Ottawa, Ontario, 7 April 1868. He was connected with the Young Ireland party and was obliged to flee to the United States at 17, where he engaged in journalism. In 1845 he returned to Ireland, but his journalistic writings compelled him to again escape to the United States in 1848. McGee then edited the New York ‘Nation’ for two years, after which he became a Royalist and went to Canada, where he was editor of ‘The New Era.’ He entered Parliament in 1857 and was a member until his assassination, which was the result of his opposition to the Fenian movement. He published: ‘History of Ireland’ (1862); ‘Speeches and Addresses of the British-American Union’ (1865); etc.

McGee, W J, American scientist: b. in Dubuque County, Ia., 17 April 1853. He was self-educated, and from 1873 to 1875 surveyed land and practised in the courts. In 1877–81 he made geologic and topographic surveys of northeastern Iowa, and for the United States Geological Survey he surveyed and mapped 300,000 square miles in the southeastern part of the country, and has performed many other important services in the departments of geology, ethnology, and anthropology. From 1893 to 1903 he was ethnologist in charge of the Bureau of American Ethnology. He is president of the American Anthropological Association, chief of the Department of Anthropology and Ethnology of the Louisiana Purchase Exposition, and associate editor of the ‘National Geographic Magazine.’ He has written: ‘Geology of Chesapeake Bay’ (1888); ‘Pleistocene History of Northeastern Iowa’ (1891); ‘The Lafayette Formation’ (1892); ‘Potable Waters of the Eastern United States’ (1894); ‘The Siouan Indians’ (1897); ‘Primitive Trephining in Peru’ (1898); and many scientific memoirs.

McGiffert, mạ-gĭf'ẽrt, **Arthur Cushman**, American theologian and author: b. Sauquoit, N. Y., 4 March 1861. He was graduated at the Western Reserve College in 1882, and at Union Theological Seminary in 1885; and at Union studies at the universities of Berlin and Marburg, Germany, and in France and Italy. In 1888–90 he was instructor in Church history at Lane Theological Seminary, Cincinnati, and professor there 1890–3, since when he has been professor of Church history at Union Theological Seminary, New York. In 1897 he published ‘A History of Christianity in the Apostolic Age,’ and in consequence of criticism and threatened denominational disturbance, involving his own probable trial for heresy, to which this book gave rise, he withdrew from the Presbyterian ministry, and later, while still retaining his professorship, joined the Congregational Church. His other publications include ‘Dialogue Between a Christian and a Jew,’ Doctor's thesis (1888), and a translation of Eusebius' ‘Church History,’ with prolegomena and notes (1890).

McGiffin, mạ-gĭf'ĭn, **Philo Norton**, American naval officer: b. Washington County, Pa., 1860; d. New York 11 Feb. 1897. He was graduated in 1882 at the United States Naval Academy, and was stationed in China, and at the outbreak of the war between China and France was permitted to resign from the United States navy to enter the service of China. He established a naval academy at Wei-hai-wei, of which he had charge. When the China-Japan war broke out he was placed in command of the Chen Yuen, and was the first American or European to command a modern warship in action. He was in command at the battle of Yalu River, in which action he was so severely injured that he afterward shot himself at a hospital in New York.

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MacGillicuddy (ma-gĭl-ĭ-kŭd'ĭ) **Reeks,** Ireland, a picturesque mountain range, in County Kerry, extending for 13½ miles from the lakes of Killarney on the east to Lough Carra on the west, and covering an area of 28 square miles. It is the loftiest mountain range in Ireland, several peaks rising above 2,500 feet.

McGillivray, ma-gĭl'ĭ-vrā, **Alexander,** chief of the Creek Indians: b. in Alabama about 1740; d. Pensacola, Fla., 17 Feb. 1793. His father w a Scotsman of good family and his mother half-breed. He received a good education Charleston, S. C.; was placed in a me establishment in Savannah; but soon to the Creek country, where he becam in a large trading house, and rose to a tion among the Indians. After the de mother he became chief of the Creek himself their emperor. During the R the McGillivrays, father and son, wer adherents of the royal cause, the form the rank of a colonel in the Briti After the war Alexander McGillivra of the Creek confederacy, entered ance with Spain, of which governm made a commissary, with the rank colonel. In 1790 he was induced b ton to visit New York, where he signed a treaty yielding certain dis lying on the Oconee. He was rewa appointment as agent for the Unite the rank and pay of brigadier-ger

MacGillivray, William, Scott b. Old Aberdeen, Scotland, 25 Jan 5 Sept. 1852. He was graduated lege, and in 1823 was assistant pro ural history at the University o later was conservator of the mu Royal College of Surgeons in Edin 1841 was appointed professor of na at Marischal College, Aberdeen. He published: 'Lives of Eminent Zoologists' (1834); 'A History of British Birds' (5 vols. 18

McGilvary, Evander Bradl linguist and philosopher: b. Ban July 1864, of American parents. cated at Bingham School, N. C. College, graduating at the latte was appointed as instructor in the classics Bingham School in 1884, and in 1889–90 studied at Princeton Theological Seminary. From 1891 to 1894 he was translator for the Presbyterian Board of Foreign Missions in Siam, and in 1894 began graduate work at the University of California, where he later became assistant professor. In 1899 he was appointed Sage professor of moral philosophy at Cornell. He has translated the Gospels of Matthew, Luke, and John, and the Acts of the Apostles into the Lao dialect of Siamese.

McGlynn, ma-glĭn', **Edward,** American clergyman: b. New York 27 Sept. 1837; d. Newburg, N. Y., 7 Jan. 1900. He was educated at the College of the Propaganda in Rome, and from 1866 was pastor of St. Stephen's Church in New York. He favored the education of children by the State rather than in parochial schools, and in 1886 warmly supported the candidacy of Henry George for the mayoralty, thereby bringing upon himself the censure of the Church. He was summoned to Rome to exculpate himself, but refused to go, pleading his

McGILL UNIVERSITY.

1. Royal Victoria College for Women
2. Library Building.

ill-health. Persisting in his refusal he was excommunicated in 1887. He was one of the founders of the Anti-Poverty Society and was its president. In 1893, after a hearing before the Pope's delegate, Mgr. Satolli, the ban of excommunication was removed, after signing a document drawn up by the apostolic delegate to the effect that his economic views were not in conflict with the Catholic faith. He was in charge of St. Mary's parish in Newburg at his death.

McGovern, ma-gŏv'ĕrn, **John**, American author: b. Troy, N. Y., 18 Feb. 1850. He was connected for 16 years with the Chicago *Tribune*, and since 1880 has been engaged in literary work and lecturing, chiefly on great writers and historical characters. In the action of S. E. Gross, author of the play 'The Merchant Prince of Cornville,' against Edmond Rostand, author of 'Cyrano de Bergerac,' he acted as literary expert for the former, furnishing in the case over 700 exhibits containing innumerable parallels between the two dramas. The United States Court at Chicago issued a decree in 1902 sustaining the claim of Gross to priority of authorship and forbidding the representation of 'Cyrano de Bergerac' in this country. McGovern's numerous writings include: 'The Empire of Information' (1880); 'A Pastoral Poem' (1882); 'The Toiler's Diadem' (1885); 'Under the Open Sky' (1890); 'King Darwin,' a novel (1894); 'American Statesmen' (1898); 'Famous Women of the World' (1898); 'John McGovern's Poems' (1902); etc.

MacGowan, John E., American journalist: b. Mahoning County, Ohio, 30 Sept. 1831; d. Chattanooga, Tenn., 12 April 1903. He was educated at Hiram College and practised law in Iowa and Ohio until the outbreak of the Rebellion in 1861, when he enlisted in the Federal army and served through the war; he was mustered out of service brevet brigadier-general. MacGowan's career as a journalist began in 1872 and he was prominently connected with the leading newspapers of Tennessee. He was a forceful writer and exerted a wide influence throughout the South. From 1878 until his death he was editor-in-chief of the Chattanooga *Times*.

MacGrady, mạ-grā'dĭ, **Thomas**, American Roman Catholic clergyman: b. Lexington, Ky., 11 June 1863. He was educated at Saint Joseph's College, Bardstown, Ky., and after theological studies at Kankakee, Ill., was ordained to the priesthood April 1887. He served at the cathedral in Galveston, Texas, for a short time, and was then rector at Houston, Texas (1888–90); at Dallas, Texas; at Lexington and Cynthiana, Ky.; and at Saint Anthony's Church, Bellevue, Ky. (1895–1902). Besides attending to his clerical duties, he wrote and lectured frequently on economic and social subjects, and his views were so radical that he was severely criticised, and was requested by the ecclesiastical authorities to retract his writings, but refused to do so, and resigned from his position in December 1902, though not withdrawing from the priesthood. His writings are avowedly socialistic, and several of them are approved and sold by the Socialist party; they include 'The Mistakes of Ingersoll' (1898); 'The Two Kingdoms' (1899); 'Beyond the Black Ocean' (1901); 'City of Angels' (1901); 'A Voice from England' (1902); and 'The Clerical Capitalist' (1902).

McGrath', **Harold**, American journalist and novelist: b. Syracuse, N. Y., 4 Sept. 1871. He was educated in Syracuse, and has been engaged in journalism since 1890. He has written: 'Arms and the Woman' (1899); 'The Puppet Crown' (1901); 'The Grey Cloak' (1903); and 'The Princess Elopes' (1905).

McGready, mạ-grā'dĭ, **James**, American Presbyterian clergyman: b. in Pennsylvania about 1760; d. 1817. He studied for the ministry in the school of John McMillan, of Cannonsburg, Pa., and in 1778 was licensed to preach. After some years of work in North Carolina, in 1796 he removed to southwestern Kentucky, and under his direction began the great revival of religion which culminated in 1800 and became memorable in the religious history of the country. He organized and conducted the first camp-meeting, and employed as preachers unordained young men without special theological training, thereby provoking dissension in the Presbyterian Church. Out of this disagreement arose the Cumberland Presbyterian Church (see Presbyterian Church), organized in 1810. McGready, however, afterward became reconciled to the older church and resumed his fellowship in it. Two volumes of his sermons were published years after his death, the first at Louisville, Ky., in 1831, the second at Nashville, Tenn., in 1833. Consult: Davidson, 'History of the Presbyterian Church in the State of Kentucky' (1847); Foote, 'Sketches of North Carolina, Historical and Biographical' (1850; 2d series, 1855); Smith, 'History of the Cumberland Presbyterian Church'; Edson, 'Early Presbyterianism in Indiana' (1898).

Machærodus, mā-kē'rō-dŭs, a genus of huge extinct cats, fossil in the Miocene and subsequent formations, and including the largest of the *Nimravidæ*. See Sabre-toothed Tiger.

McHenry, James, American politician: b. Ballymena, Ireland, 1753; d. 1816. He had studied at Dublin, when, about 1771, he came to this country, and in Philadelphia soon entered upon the study of medicine under Dr. Benjamin Rush (q.v.). On the outbreak of the Revolution he became surgeon of the 5th Pennsylvania battalion; in November 1776 was taken prisoner at Fort Washington; was paroled in the following January, and in March 1778 exchanged. In May of that year he was made assistant private secretary to Washington, and held that position until October 1780, when as major he was appointed to a place on the staff of Lafayette. Elected in 1781 to the Maryland Senate, he continued a member of that body until 1786, being also during the second half of that period a delegate to the Confederation Congress. In 1787 he was made a member of the Constitutional Convention; in 1789 was elected to the General Assembly of Maryland, and sat in the Senate of that State, 1791–6, when he was appointed by Washington secretary of war, retaining that position in the Cabinet under John Adams' administration until 1800. As an ardent Federalist he used his influence in favor of a strong national defense, and was a zealous partisan of Alexander Hamilton. After resigning from Adams' Cabinet he spent the rest of his life in Maryland. Fort McHenry (q.v.) was named after him.

McHenry, măk-hĕn'rĭ, **James,** American physician and author: b. Larne, Ireland, 20 Dec. 1785; d. there 21 July 1845. He was educated in Dublin and Glasgow and in 1817 emigrated to the United States and finally settled in Philadelphia, where he practised medicine and was engaged in mercantile business. In 1842 he was appointed United States consul at Londonderry and held that post until his death. Among his works are: 'The Usurper: an Historical Tragedy' (played in Philadelphia 1820); 'O'Halloran, or the Insurgent' (1824); 'The Betrothed of Wyoming' (2d ed., 1830); etc.

McHenry, Fort. See FORT MCHENRY.

Machete, ma̤-chā'tā, a short sword-like tool, half knife, half cleaver, used in Cuba and other countries of tropical America for cutting cane and as a weapon in war. It was first brought into prominence during the Cuban revolution.

Machias, ma̤-chī'a̤s, Maine, town, county-seat of Washington County; on the Machias River, and on the Washington County railroad; about 120 miles east by north of Augusta. It is about 12 miles from the mouth of Machias River. A trading post was established here in 1633, by Englishmen, but after a few months they were forced by the French to abandon the place. The first permanent settlement was made in 1763, and in 1784 it was incorporated as a town. It was besieged by the British from 1 August to 1 November 1777, and other attacks were made later. The original township of Machias was divided into East Machias, Machiasport, Marshfield, and Whitneyville.

The chief industries are ship-building, lumbering, and fishing. It has considerable coast trade. The principal buildings are the Government building, the court-house, the United States Marine Hospital, and the Porter Memorial Library. Pop. (1900) 2,082. Consult; 'Memorial of the Centennial Anniversary of the Settlement of Machias.'

Machiavelli, Niccolo, nē-kō-lō' mä̆-kē-ă-vĕl'lē or măk-ĭ-a̤-vel'lĭ, Italian historian and statesman, possibly the greatest prose writer of the Italian Renaissance: b. Florence 3 May, 1469; d. there 22 June 1527. Of Niccolo's early life and education we know nothing. No trace of him remains previous to his 26th year. But of his times and the scenes amid which he grew up, we know much. It was the calm but demoralizing era of Lorenzo the Magnificent. Machiavelli was a true child of his time. He too was thoroughly imbued with the spirit of the Renaissance; and looked back, fascinated, on the ideals of that ancient world that was being revivified for the men of his day. But philosophy, letters, and art were not the only heritage that the bygone age had handed down; politics — the building of states and of empire — this also had engaged the minds of the men of that age, and it was this aspect of their activity that fired the imagination of the young Florentine. From his writings we know he was widely read in the Latin and Italian classics. But Virgil and Horace appealed to him less than Livy, and Dante the poet was less to him than Dante the politician; for he read his classics, not as others, to drink in their music or be led captive by their beauty; but to derive lessons in statecraft, and penetrate into the secrets of the successful empire-builders of the past. It is equally certain, from a study of his works, that he had not mastered Greek. Like Ariosto, Machiavelli was indebted for his superb literary technique solely to the study of the literature of his own nation.

With the expulsion of the Medici from Florence, Machiavelli, at 30, emerged from obscurity to play a most important role in the Florentine politics of the succeeding decade and a half. In 1498 he was elected secretary to the Ten of War and Peace, and from 1498 to 1512 was a zealous, patriotic, and indefatigable servant of the republic. His energy was untiring, his activity ceaseless and many-sided. He conducted the voluminous diplomatic correspondence devolving upon his bureau, drew up memorials and plans in affairs of state for the use and guidance of the Ten, undertook the reorganization of the Florentine troops, and went himself on a constant succession of embassies, ranging in importance from those to petty Italian states up to those to the court of France and of the Emperor. He was by nature well adapted to the peculiar needs of the diplomacy of that day; and the training he received in that school must in turn have reacted on him to confirm his native bent, and accentuate it until it became the distinguishing characteristic of the man. His first lessons in politics and statecraft were derived from Livy's history of the not over-scrupulous Romans; and when he comes to take his lessons at first hand, it is in the midst of the intrigues of republican Florence, or at the court of a Caterina Sforza, or in the camp of a Cesare Borgia. Small wonder that his conception of politics should have omitted to take account of honesty and the moral law; and that he conceived «the idea of giving to politics an assured and scientific basis, treating them as having a proper and distinct value of their own, entirely apart from their moral value.»

During this period of his political activity we have a large number of state papers and private letters from his pen; and two works of literary cast. These are his 'Decennale': historic narratives, cast into poetic form, of Italian events. The first treats of the decade beginning 1494; and the second, an unfinished fragment, of the decade beginning 1504. They are written in easy *terzine;* and are noteworthy as expressing the sentiment for a united Italy.

When in 1512 the Medici returned to Florence in the train of her invader, Machiavelli was dismissed from his office and banished for a year from the confines of the city. Later, on suspicion of being concerned in a plot against the Medici, he was thrown into prison and tortured. He was afterward included in a general pardon granted by Leo X. But Machiavelli did not return to public life until 1525; and this interval of enforced leisure from affairs of state was the period of his literary activity. A number of comedies, minor poems, and short prose compositions did not rise above mediocrity. But in one dramatic effort he rose to the stature of genius. His 'Mandragola' achieved a flattering success, both at Rome and in Florence. It has been pronounced the finest comedy of the Italian stage, and Macaulay rated it as inferior only to the greatest of Molière's. In its form, its spontaneity, vivacity, and wit, it is not surpassed by Shakespeare; but it is a biting satire on religion and morality, with not even a hint of a moral to redeem it.

His lesser prose works are the ‹Life of Castruccio Castracani,› and the ‹Art of War,› a treatise anticipating much of our modern tactics. A more ambitious undertaking, and his largest work, is the ‹History of Florence.› At the suggestion of the Cardinal de' Medici, the directors of the studio of Florence commissioned Machiavelli to employ himself in writing a history of Florence, «from whatever period he might think fit to select, and either in the Latin or the Tuscan tongue, according to his taste.» He was to receive one hundred florins a year for two years to enable him to pursue the work. He chose his native tongue; and revised and polished his work until it became a model of style, and in its best passages justifies his claim to the title of the best and most finished of Italian prose writers.

But though Machiavelli had the historical style, he lacked historical perspective; he arranged his matter not according to objective value, but placed in the boldest relief those events that best lent support to his own theories of politics and statecraft. He makes his facts to be as he wishes them, rather than as he knows them to be. To Machiavelli history was largely to be written as a *Tendenzroman*,— manufactured to point a preconceived moral. Though Machiavelli wrote history, poetry, and comedy, it is not by these he is remembered. The works that have made his name a synonym, and given it a place in every tongue, were written almost in the first year of his retirement from political life: ‹The Prince› and the ‹Discourses on the First Ten Books of Titus Livius.› Each is a treatise on statecraft; together they form a complete and unified treatise, and represent an attempt to formulate inductively a science of politics. The ‹Discourses› study republican institutions, ‹The Prince› monarchical ones. The first is the more elementary and would come first in logical arrangement. But in the writing of them Machiavelli had in view more than the foundation of a science of politics. He was anxious to win the favor of the Medici; and as these were not so much interested in how republics are best built up, he completed ‹The Prince› first, and sent it forth dedicated «to the magnificent Lorenzo, son of Piero de' Medici.» In the ‹Discourses,› the author essays «a new science of statesmanship, based on the experience of human events and history.» In that day of worship of the ancient world, Machiavelli endeavors to draw men to a study of its politics as well as its art. In Livy he finds the field for this study.

In his commentary on the course of Romulus in the founding of Rome, we find the keynote of Machiavelli's system of political science. His one aim is the building of a state; his one thought, how best to accomplish his aim. Means are therefore to be selected, and to be judged, solely as regards their effectiveness to the business in hand. Ordinary means are of course to be preferred; but extraordinary must be used when needed.

In ‹The Prince,› a short treatise of 26 chapters, and making little more than a hundred octavo pages, Machiavelli gives more succinct and emphatic expression to the principles of his new political science. It is the best known of all his works. It is the one always connected with his name, and which has made his name famous. For the model of his prince, Machiavelli took Cesare Borgia, and cites him as an example worthy of imitation; and he has shared in the execration that posterity has heaped upon Borgia. The strangest moral contradictions abound throughout ‹The Prince,› as they do in all Machiavelli's writings. He is saint or devil according as you select your extracts from his writings.

Shakespeare, reflecting English thought, uses his name as the superlative for craft and murderous treachery. But later years have raised up defenders for him, and his rehabilitation is still going on. He has been lauded as «the noblest and purest of patriots»; and more ardent admirers could «even praise his generosity, nobility, and exquisite delicacy of mind, and go so far as to declare him an incomparable model of public and private virtue.»

His rehabilitation proceeds from two causes. Later research has shown that perhaps he only reflected his time; and his works breathe a passionate longing for that Italian unity which in our day has been realized. He may be worthy canonization as a national saint; but those who are more interested in the integrity of moral standards than in Italian unity will doubtless continue to refuse beatification to one who indeed knew the Roman *virtus*, but was insensible to the nature of virtue as understood by the followers of Christ. And no amount of research into the history of his age can make his principles less vicious in themselves. A better understanding of his day can only lessen the boldness of the relief in which he has heretofore stood out in history. He was probably no worse than many of his fellows. He only gave a scientific formulation to their practices. He dared openly to avow and justify the principles that their actions implied. They paid to virtue the court of hypocrisy, and like the Phariseee of the earlier time, preached righteousness and did evil; but Machiavelli was more daring, and when he served the devil, disdained to go about his business in the livery of heaven. Among the editions of the collective works of Machiavelli may be mentioned those of Milan, 1810–11; Florence, 1813; Milan, 1821–2; Florence, 1826, 1843; and Florence (6 vols., 1873–7); Boston English translation (1891). Consult Villari, ‹Niccolo Machiavelli e i suoi tempi (1877–82), English translation (1892); Tommasini, ‹La vita e gli scritti di Niccolo Machiavelli (1882); Mourrisson, ‹Machiavel› (1883).

Machine Composition. See COMPOSING MACHINES.

Machine Engraving, a mechanical process for engraving on wood, metal or stone. Since 1880 numerous machines have been invented to produce regular tints, geometrical and other designs and patterns, far more rapidly than by hand work. The most complex engraving is now executed wholly by machinery. Engraving by mechanical means is now generally employed in the making of bank-notes, diplomas, stock certificates and other papers and documents, where special designs are required. Elaborate gearing systems have been introduced whereby the cutting tools execute a certain number of symmetrical motions and thus produce elaborate geometrical patterns.

Machine Gun. See ORDNANCE.

Machinery Manufacturing Industry in America. There was practically no machinery in America at the outbreak of the

Revolutionary War. The jealous policy of Great Britain, which aimed to concentrate within her borders all the improvements in the arts, prompted legislation from 1750 to the close of the century, first to prevent the manufacture of iron in this country beyond the stage of pig and bar, then to prevent the exportation from Great Britain of any «tool or utensil used in working up or finishing cotton or linen, woolen or silk manufactures, and of any other tool or utensil which now is, or at any time or times hereafter may be, used in working, finishing, or completing of the iron or steel manufactures of this kingdom,» under penalty of forfeiture of such tools or utensils, a fine of £200, and imprisonment for twelve months. Foreigners were forbidden by British law, under penalty of £500 and imprisonment in the common jail for twelve months, «from seducing artificers, and others employed in the manufactories, to depart out of this kingdom; and if any artificer has promised or contracted to go into foreign parts to practise or teach his trade, such artificer may be obliged to give security, at the discretion of the court, that he shall not go beyond the seas, and may be committed to prison until he give such security.» These acts were rigidly enforced for a time and were not rescinded until 1845. In consequence of this legislation machinery could not be obtained from England, and the only alternative was to rely upon our own mechanical ability and construct what was needed at home.

The first textile mill in this country to use the Arkwright system was built in Pawtucket, R. I., in 1790, by Samuel Slater. All of its machinery was built by him on the premises, although he brought with him from England no plans or models of the machinery. What expedients he must have resorted to, and what a school it was for his workmen! At this period woolen cloth fabricated in the household was the only domestic source of the supply of that article; but in 1793 John Schofield and his brother Arthur, both Englishmen immigrated to this country, and constructed, with the aid of some persons of wealth in Newburyport, Mass., the first carding machine that was worked in the United States. This apparatus was first turned by hand; but when the remaining machinery was completed the factory was put into operation by water-power, the business thenceforth being conducted prosperously. Like the cotton-mill of Slater, the machinery of this first woolen-mill was built by Schofield on the premises. At this time the lathe had but lately advanced beyond the first stage of its existence, that of two dead-centres, which supported the work as it was rotated backward and forward by a band around it, one end attached to a spring-pole above it, the other end to the foot of the operator, while the turning-tool was held in his hand. Even when the lathe had advanced beyond this first stage, and was provided with a revoluble spindle and centre, by which the work was axially supported and rotated, the tools for turning either wood or iron were still held and manipulated by hand. Because of the demand for large numbers of cylindrical iron pieces exactly parallel and of like diameter, which manual skill could not produce, the slide rest, which had been found only in the workshop of the optician and the mathematical-instrument maker, now came into common use as an adjunct of the lathe. From this time the capacity of the lathe to produce cylindrical work of the required exactitude was unlimited, but the workman had to manipulate the slide-rest to enable the cutting-tool which it carried to perform its work. As a consequence the slide-lathe was introduced, whereby the advance of the cutting-tool, and the rotation of the work, were automatically performed. The facilities for producing the long, flat, and straight surfaces best adapted for such a machine were limited to the hammer and the cold-chisel, the file and the straight-edge, so that the slide-lathe had a curious development. The hand-lathe, with its wooden bed and short slide-rest, could produce cylinders economically, and these were utilized for slide-lathe beds; but lacking stability, as well as security for the slide-rest, the cast-iron bed dressed by the cold-chisel and the file was finally adopted. The form of the guiding surfaces of the slide-rest was, however, modified in the lathe to save hand-labor, and this distinctive form has maintained an existence to the present day. The next development of the slide-rest was the planing-machine, whereby the rough and irregular surface of the castings and forgings, traveling slowly under a cutting-tool movable at right angles to the travel of the work, was smoothed and reduced to a true plane. The advent of this machine was an era in the life of the machinist, as great, perhaps, as that of the slide-rest. It is uncertain when the first one was started, but in 1838 there were only four of these machines in the United States. The drill, which before that had been limited to a revolving vertical spindle, had an iron frame, and a table at right angles to it, upon which the work might be rigidly supported and adjusted with ease and certainty. The boring-mill or vertical lathe was then economically possible, and took its place in the machine-shop to execute a large class of turned work that did not require to be supported upon centres. Much of this work consisted of wheels that had to be keyed upon their shafts. The seats for these keys were chipped and filed, and the first development of the planing-machine was the key-seating machine, in which the tool moved while the work was fed against it. The capacity of such a machine for other work was soon developed, and when provided with compound slide-rests and a revoluble table mounted thereon, it took its place as a standard tool in the machine-shop, under the name of the slotting-machine. This planer, with its vertically movable tool, was the progenitor of a machine with similar attachments, but with its tool moving horizontally, upon which work could be conveniently shaped in a great variety of forms; and the shaping-machine, as it was called, soon became one of the standard tools of the machine-shop. With the advent of these tools the art of driving the cold-chisel and of guiding the file, once the criterion of a good workman, was rarely exercised. In the meantime, however, the vertical spindle-drill, with its compound tables, movable vertically and adjustable horizontally, in two directions at right angles with each other, had been supplemented by the horizontal drill, with similar tables, but with its drill-spindle parallel to the tables; and the further requirements in this direction had been supplied by the radial drill, in which the vertical drill-spindle is movable about a vertical axis, toward and from which it is adjustable radially.

The development of the machine-shop was

not, however, exactly in the order above indicated; it had other requirements which these tools supplied inadequately, if at all, among which were the screw-bolts and nuts for securing the parts of the machines together, a want which had been imperfectly supplied before even the original lathe had an existence. The iron screw-bolt was then formed by compressing a split die upon it, provided with spiral threads, and rotating the bolt or the die backward and forward until the thread was partly cut and partly raised to its completed form, while a taper-tap was screwed into the nut from one side and then from the other, until by trial the nut was found to enter upon the bolt. The apex of the thread was always larger than the diameter of the bolt, and bolts and nuts were only interchangeable by accident. The slide-lathe made it possible to cut out the thread without raising it, but for the great mass of bolts this was far too expensive, so that the split die continued to produce its imperfect product in this country until the solid die patented by Philetus W. Gates, 8 May 1847, with sectional threads, was introduced. After this die had cut the thread at one pass, its direction of rotation was reversed to unscrew it from the bolt, which not only left a mark upon the thread, but was liable to injure the die, and no compensation for wear was possible. It was not until 1857 that a bolt machine was devised by William Sellers, and constructed by his firm in which dies to cut the thread at one pass, and adjustable to size, could be opened and closed while running continuously in one direction, and thereafter ordinary screw-bolts could be made interchangeable. In 1860 this tool was introduced into England, and subsequently upon the continent of Europe. Another of the early machine-shop tools was the gear-cutter, simply a revolving milling-cutter against which the wheel was forced, mounted upon a spindle above the dividing-plate on the same spindle. The only power used was that required to rotate the cutter; the movement against the cutter and its reverse, and the division or adjustment for the next tooth, were performed by the workman. The cost of such work was so great that the teeth of nearly all wheels, even for fine machines, were cast, until a machine was devised by William Sellers, and constructed by his firm in 1867, and exhibited at the Paris Exposition in the same year, in which the work of the operative was limited to adjusting the wheel to be cut to the cutter. After that the machine proceeded with the work of cutting each tooth, retracting the cutter, turning the wheel for the next tooth, and so on, until the wheel was completed in less time than it could be done when these movements were effected by hand; so that now one man can easily attend several machines, and cast teeth are no longer admissible in good machines. One other typical machine-tool which has received its greatest development in this country must be referred to — the milling machine, by which the various shapes in firearms are fashioned. It must not be supposed, however, that the above comprise all or nearly all of the machine-tools now in common use; they are but types, upon which an infinite variety of changes have been wrought to adapt them to special requirements. Their development marked the first stage of the machinist's art, when machine-tools were only required to perform the simple operations of turning and planing, drilling and milling, to make other machines.

Along with the development of these tools for general purposes came a development of the system of interchangeability as an economical principle in manufacturing machinery, requiring in some instances special machines, but more commonly special tools or appliances for use in connection with the ordinary machine-tools. While it cannot be claimed that this country was the first to attempt manufacturing machinery upon this principle, it must be admitted that the system was in successful use here very many years in advance of any other nation, and that its success here brought about its adoption abroad. For the economical manufacture of machinery or of apparatus in which large numbers of the parts shall be interchangeable there are certain preliminary conditions which must be observed: first, reference standards must be provided, with which to compare the several parts and determine the tolerance — that is to say, the amount of variation permissible between the standard and the product; second, every part of the finished piece must be completed without the intervention of hand labor; and third, for every piece a base must be established, to which each and every succeeding operation must refer; consequently every piece must form a separate study to determine the best appliances for each operation, so that the efficiency of the operation shall not be dependent upon the skill of the operator. The first application of these principles was made upon firearms in our government arsenals, under the direction of Eli Whitney, the inventor of the cotton-gin. The growth of the system must have been slow, and confined for a long period to a few of the principal parts; but from the first it had proved economical, for in 1822 Calhoun, then Secretary of War, admitted to Whitney that the government was saving $25,000 per year at the two public armories alone by the use of his improvements. The drop forging-press, with its dies conforming to the shape desired, served to produce expeditiously in red-hot metal all of the smaller parts of the gun, closely approximating the finished size and shape. The milling-machine, when its capacity was developed, accurately finished these forged parts, however varied the shape; and the drill, when the order of procedure had been determined and the guiding templets were provided, fashioned the bearings for the working parts and the holes for securing the parts in position. The wooden gun-stock, of irregular form, was rapidly and automatically shaped exteriorly as it and its model revolved in a lathe designed by Thomas Blanchard, and patented by him 20 Jan. 1820. Other special tools routed the groove for the gun-barrel and the cavity for the lock, with the other details required to receive the guards and fastenings of the gun, with such accuracy that the several parts could be assembled as they came from the machines. The accuracy then attainable, however, was far short of that now demanded; the gun then produced did not require it. The machine-tools were limited in variety and comparatively rude of structure, so that the quality of their work could not be depended upon. The vernier caliper was the most delicate instrument of measurement, and a thousandth of an inch was its extreme limit of accuracy, while the form of the screw-thread did not admit of very accurate determination. As the quality of machine-tools improved, appliances necessary to detect with certainty an error of the twenty thousandth of an inch were supplied by the Pratt & Whitney Company, after designs by Professor W. A. Rogers and Mr. George M. Bond; and the form of screw-threads advocated by Mr. William Sellers in a paper read before the Franklin Institute, 21 April 1864, soon became the standard for the United States; so that now a degree of accuracy is easily attainable which, at the introduction of the system, was impossible. From the first the method of working the interchangeable system had proved economical, and, with the growth of excellence in every detail of machinery, the system had been so extended and improved that the knowledge of its advantages reached to foreign countries, and various commissions were appointed to investigate it. In 1870 the German government contracted with the Pratt & Whitney Company for gun machinery to the value of $350,000, and within the next three years for $1,250,000 more; and until 1875 the company was kept busy on European orders. By a supplemental contract with the German government the Pratt & Whitney Company agreed to superintend the erection of the machinery they had furnished, and to instruct native workmen how to operate it. The results were entirely satisfactory, and about the same time other manufacturers of gun-making tools, notably Brown & Sharpe, of Providence, R. I., received large orders for such machinery from other foreign countries, and our system for the manufacture of this class of interchangeable parts was thus established in England and on the continent of Europe.

In brief, for more than half a century this country has been in possession of a system of manufacture peculiar to itself, developed first in the manufacture of the larger class of firearms, then extended to pistols, and subsequently to a great variety of products, such as the sewing-machine, the typewriter, the bicycle, and the watch, all of which stand to-day unrivaled. The improvement in agricultural machinery (q.v.) doubtless contributed quite as much to our agricultural supremacy as did the fertility of American soil. And an equally large part has been played by American machinery in textile manufactures, shoe- and garment-making, and even in carpentering and joinery.

The same changes have occurred in the fabrication of metals, and the blast-furnace, whose maximum product was 25 to 30 tons per week, now produces 500 tons per day. In transportation the team of horses has long since been displaced by the locomotive, and present indications point to another and more efficient substitute.

The immense number of similar parts which the automatic machinery of these and other industries demanded afforded opportunity for the introduction of machine-tools to manufacture machinery, as distinguished from those designed simply for making it. The difference may be illustrated in the two processes of making a turned bolt with a square or hexagonal head, the one after the introduction of the slide-lathe, and the other at the present time. Then, a bar of iron of suitable size was heated and forged by the smith to a size and shape approximating that of the finished article; this was centred; a carrier was secured upon one end whereby it could be rotated; the end opposite the carrier was squared in the slide-lathe by a side-tool, the carrier was transferred to the other end of the bolt, and the opposite end was squared, the side-tool was changed for another tool, adapted to turning the body of the bolt, and this again for another, adapted to cutting the thread. At each change of carrier and of tool the lathe was stopped that the workman might release the one tool and secure the other. Now, the iron bar, square or hexagonal, and of the size and shape of the head of the bolt, is delivered from the rolling-mill to the attendant of the machine, who thrusts it into the machine against a stop; the machine grips it, squares off the projecting end, turns up the body of the bolt, cuts the thread, bevels the end, and finally cuts off the bar beyond the last turning, to make a head, and the bolt drops, a finished product. The machine releases the bar, moves it forward the distance required for another similar bolt, and repeats its operations, until the bar is converted into bolts; and it could, if desirable, inform its attendant that it was out of work, or notify him of the fact by stopping its movement. The attendant is no longer of necessity a machinist, for his only occupation is to provide his machine with bars, to remove its product, and to keep it clean, duties which attendance upon a number of such machines does not make onerous. The turned bolt so manufactured is as good as, but no better than, that which was first forged and then finished upon the simple slide-lathe; but the product of the workman is vastly greater, and the skill required for it is far less. For such apparatus quantity of like product is the first requisite. Given this, and the skill of the engineer and the machinist is demanded to produce by successive automatic operations the desired result. These operations without the intervention of human intelligence may at first be few in number, but they will be extended from time to time as experience warrants or as future discoveries may render possible.

The field, then, for machinery and for manufacturing interests is forever widening. Every secret of nature that is unfolded, every discovery in the arts, every combination that produces new results, only opens other avenues of progress, which must become more rapid and more diverse with the growth of the centuries. It would be interesting to determine accurately, if that were possible, what is now the annual product of this new industry; but the census gives only the aggregate value of the machinery, tools, and implements in use, and the annual production of all manufacturing industries. The last census gives the number of foundries and machine-shop establishments at 9,234, the capital employed at $665,058,245 and the number of employees at 350,327, and if we assume the annual product per employee to be $1,500, we shall have an annual production of machinery equal to $525,490,500, which is probably a moderate estimate. The importation of machinery is so small compared with our own production that the cost has but little effect upon our market, particularly so as its design and construction are generally regarded as inferior to our own. See HARDWARE INDUSTRY; AGRICULTURAL MACHINERY AND IMPLEMENTS.

WM. SELLERS,
William Sellers & Co., Philadelphia.

Machol′, or **Mahhol′** (Hebrew), a word in the Old Testament, associated with «toph» (timbrel), and almost always rendered in the English version by «dances» or «dancing.» It is not improbable that *machol* and *toph* may mean «pipe and tabor,» as these two instruments are often associated with dancing.

McIlhenney, măk-ĭl-hĕn′ĭ, **Charles Morgan**, American landscape painter: b. Philadelphia 4 April 1858. Having studied under Frank Briscoe, he continued his course of training at the Academy of Fine Arts in Philadelphia, and soon began to win recognition in his chosen field. Among his best known works are ‘A Gray Summer Noon’ (1884), and ‘The Passing Storm’ (1887). In 1893 he was awarded medals at the Columbian Exposition and won the first Hallgarten prize.

McIlvaine, Charles Pettit, American Protestant Episcopal bishop: b. Burlington, N. J., 18 Jan. 1799; d. Florence, Italy, 13 March 1873. He was graduated at the College of New Jersey (now Princeton University), in 1816; entered the Princeton Theological Seminary in the same year, and was ordained deacon in 1820 and priest in 1821. His first pastoral charge was at Georgetown, D. C., which he left in 1825 to become professor of ethics at the United States Military Academy, West Point. He became rector of St. Ann's Church, Brooklyn, in 1830, and in 1831 undertook the duties of the professorship of the evidences of religion and sacred antiquities in the University of the City of New York. He did not long hold the chair, however, as he was the next year elected bishop of Ohio, to succeeded Bishop Chase, who had resigned the see. The question of the legality of such a resignation excited considerable interest in the General Convention of that year, but in the interest of the diocese both houses agreed in approving Dr. McIlvaine's testimonials, and he was accordingly consecrated in St. Paul's Chapel, New York. Upon his removal to Ohio he was elected president of Kenyon College, Gambier, founded by Bishop Chase, and held the position until 1840, acting also for some years as president of the Theological Seminary in the same place. During his long episcopate he came to be recognized as one of the most influential leaders of the Evangelical or Low Church party in America, and his ability and courtesy were cordially recognized by those who differed from him most widely. During the Civil War he was one of the four ambassadors informally appointed by President Lincoln to set before the English people what was considered in the North the real significance of the War. He published various sermons, addresses, and more important theological works, mainly directed to defending the positions of his party in the Church.

McIntosh, măk′ĭn-tŏsh, **Lachlan**, American soldier: b. near Inverness, Scotland, 17 March 1725; d. Savannah, Ga., 20 Feb. 1806. He came with his father to Georgia in 1736, received there an ordinary English education, became a clerk in the mercantile establishment of Henry Laurens at Charleston, S. C., and was later employed as a land surveyor. At the opening of the Revolution he was made colonel of the 1st Georgia battalion, and became a brigadier-general in 1776. In 1777 he fought a duel with Button Gwinnett (q.v.), who was fatally wounded. In 1778 McIntosh was selected by Washington to lead a small force against the Western Indians, whom he subdued. In the siege of Savannah, 1779, he bore an active part. When Charleston surrendered to Sir Henry Clinton 12 May 1780 McIntosh was taken prisoner, and he never resumed his command. He was a member of the Continental Congress in 1784, and the next year as commissioner to the Indians he finished his public services.

MacIntosh, Maria Jane, American author: b. Sunbury, Ga., 1803; d. Morristown, N. J., 28 Feb. 1878. In 1835 she removed to New York; and having suffered pecuniary reverses resorted to her pen for support, publishing in 1841 ‘Blind Alice,’ under the pseudonym of «Aunt Kitty,» by which she continued subsequently to be known. It was followed by ‘Conquest and Self-Conquest,’ ‘Praise and Principle,’ and other tales between 1841 and 1846, each designed to inculcate some moral sentiment. In 1846 she published a work entitled ‘Two Lives, or to Seem and to Be,’ and in 1847 her stories were collected in a single volume as ‘Aunt Kitty's Tales.’ Other works are: ‘Charms and Counter-Charms’ (1848); ‘Donaldson Manor’ (1849); ‘Woman in America’ (1850); ‘The Lofty and the Lowly’ (1853); ‘Violet, or the Cross and the Crown’ (1856); ‘Meta Gray’ (1858); ‘Two Pictures’ (1863).

McIver, Charles Duncan, American educator: b. Moore County, N. C., 27 Sept. 1860. He was graduated from the University of North Carolina in 1881, adopted teaching as a profession and after organizing the public schools of Winston and Raleigh, became one of the faculty of Peace Institute, Raleigh, in 1886. He was State Institute conductor, 1889–92, and has held important educational posts in his native State, as chairman of the committee of the Teachers' Assembly in 1891 assisting in securing the establishment of the North Carolina Normal and Industrial College. In 1892 he became the first president of this institution, the only college for women in the State receiving an annual appropriation from the public funds. He is a member of the Southern Educational Board, which controls the Peabody Fund.

Mack von Leiberich, māk fōn lī′bĕ rĭн, **Karl**, BARON, Austrian military officer: b. Nennslingen, Franconia, 24 Aug. 1752; d. Saint Polten, Austria, 22 Oct. 1828. He entered the army of Austria in 1770, and was in 1797 created field-marshal. After the peace of Campo Formio, he was appointed by the King of Naples to the command of his troops, and took the field against the French and occupied Rome; but a riot in Naples, caused by his having concluded an armistice with the French, forced him to take refuge in the French camp. He was carried prisoner to Paris, but escaped in 1800 and in 1805 was sent to check the French advance along the line of the Iller. But the enemy shut him up in Ulm, and on Oct. 17 Mack capitulated with his army. He was tried by court-martial, but the sentence of death was commuted by the Austrian emperor to expulsion from the army and 20 years' imprisonment. In 1808 Mack was liberated, and in 1819 fully pardoned.

Mackay, mạ-kā′ or mạ-kī′, **Charles**, English poet, journalist, and miscellaneous writer: b. Perth, Scotland, 27 March 1814; d. London

24 Dec. 1889. He was editor of the 'Illustrated London News,' 1852–9, lectured in the United States, 1857–8, and was a special correspondent of the London *Times* in New York during the Civil War (1862–5). He was famous for his songs, many of which he set to music of his own. 'Cheer, Boys, Cheer,' is the best known of these. Among his many books are: 'The Salamandrine, or Love and Immortality' (1842); 'Voices from the Crowd' (1846); 'Voices from the Mountains' (1847); 'History of the Mormons' (1851); 'Lost Beauties of the English Language' (1874); 'Forty Years' Recollections' (1878); 'Through the Long Day' (1887); 'A Dictionary of Lowland Scotch' (1888).

Mackay, Clarence Hungerford, American capitalist: b. San Francisco 17 April 1874. The son of J. W. Mackay (q.v.), he succeeded on the death of his father to his vast business interests. Much of his boyhood was spent in France, and he was educated at Vaugirard College, afterward studying at Beaumont College, Windsor, England. He became proficient in modern languages, several of which he speaks fluently.

McKay, Donald, American shipbuilder: b. Nova Scotia 1810; d. 1880. He went to New York and learned ship-building, and began the business at Newburyport, Mass. At East Boston, in 1845, he established a shipyard where he built many large trading ships of the clipper model, in which he made great improvements. The Great Republic, which he built, a ship of 4,500 tonnage, was a larger vessel than had ever before been seen.

Mackay, George Eric, English poet, son of Charles Mackay (q.v.): b. London 25 Jan. 1851; d. 2 June 1898. Among his works are: 'Songs of Love and Death' (1865); 'Ad Reginam' (1881); the popular 'Love Letters of a Violinist' (1886); 'A Lover's Litanies' (1888); 'Nero and Actæa,' a tragedy (1891); 'My Lady of Dreams' (1895); 'Arrows of Song' (3d ed. 1896); 'A Lover's Missal' (1898).

McKay, Gordon, American inventor and manufacturer: b. Pittsfield, Mass., 1821; d. Newport, R. I., 19 Oct. 1903. He was the son of a cotton manufacturer, and at 12, on the death of his father, learned civil engineering, at which he worked for some time. Before he was 21 he built a machine-shop in Pittsfield which employed 100 men, and later became treasurer and manager of the Lawrence Machine Company. He was the first successful inventor of machinery for making boots and shoes; he perfected a shoe sewing-machine, invented, but not made practicable, by L. R. Blake, of Abington, Mass.; afterward invented the heeler, lasting-machine, nailing-machine, etc., which came into general use; and by these inventions revolutionized the boot and shoe industry of the world. At the outbreak of the Civil War he offered to make the shoes for the Union army, and within three years had leased his machines to more than 60 firms, and shortly became a millionaire. In 1878 he formed the McKay Sewing-Machine Association, a strict monopoly which exacted commissions on all shoes made in the United States by the aid of his inventions, and also brought profit through European royalties. In 1893 he placed $4,000,000 in a trust fund for Harvard University. He made many other liberal donations for benevolent and educational objects, and established near Kingston, R. I., the McKay Institute for the manual training of colored youth. By his will the greater part of his estate was left to Harvard.

Mackay, John William, American capitalist: b. Dublin, Ireland, 28 Nov. 1831; d. London 20 July 1902. His parents brought him to New York in 1840, and he learned ship-building. He went to California as a miner in 1851, and afterward to Nevada, where he continued mining with great perseverance in the face of many disappointments. In 1872 he was one of the discoverers of the Bonanza mines of the Comstock Lode (q.v.), in which mines he obtained a two fifths share, and became very wealthy. He and his partners, Fair, Flood, and O'Brien, founded the Bank of Nevada, of which Mackay was president for years. His relations with Jay Gould being unfriendly, in a spirit of opposition to him, and to the Western Union Telegraph Company, Mackay in 1884 joined with James Gordon Bennett in forming the Commercial Cable Company and the Postal Telegraph Company. He succeeded in laying two cables, overcoming great obstacles, and afterward won in a long rate-war with the old lines. The Roman Catholic Orphan Asylum at Virginia City, Nev., founded by him, is noteworthy among his many public benefactions.

Mackay-Smith, Alexander, American Protestant Episcopal bishop: b. New Haven, Conn., 2 June 1850. He was graduated from Trinity College, Hartford, in 1872, entered the Episcopal ministry and took priest's orders in 1877. After holding rectorships in South Boston, Mass., and New York successively, he was rector of St. John's, Washington, D. C., 1893–1902. In the year last named he was consecrated coadjutor-bishop of Pennsylvania.

Mackaye, ma-kā', **James Steele,** American playwright: b. Buffalo, N. Y., 1844; d. Timpas, Colo., 25 Feb. 1894. In 1868 he went to Paris to study painting; but having there met Delsarte (q.v.) became interested in the latter's theories, and studied dramatic expression. In 1870–1 he gave in New York and Boston lectures on the art of expression. He opened the St. James Theatre at New York in 1872, and appeared there in 'Monaldi,' adapted by himself from the French. In 1873–5 he was studying the drama in Paris and England, and at the Crystal Palace, London, he played the title-rôle in 'Hamlet.' His adaptation of Blum's 'Rose Michel' in 1872 ran for 122 nights at the Union Square Theatre, New York. He established in New York the Lyceum School of Acting, which later became the American Academy of Dramatic Arts. For several years he was manager of the Madison Square theatre, and in 1885 built the Lyceum. Among his further plays were: 'Won at Last'; 'Through the Dark'; 'Hazel Kirke'; 'A Fool's Errand'; 'In Spite of All'; 'Paul Kauvar.'

McKean, ma-kēn', **Thomas,** American patriot and jurist, signer of the Declaration of Independence: b. New London, Chester County, Pa., 19 March 1734; d. Philadelphia 24 June 1817. He was privately educated at Newcastle, Del.; having settled there, he studied law and was admitted to the bar in 1755; at once became register of probate, and was soon made assistant attorney for Sussex County. With Cæsar Rodney (q.v.), in 1762, he entered upon a revision of Delaware laws up to 1752, and was chosen in the same year to the Delaware Assembly, in which his membership continued till 1779. Elected in 1765 to the Stamp Act Congress (see STAMP ACT), he took a strong position in defense of colonial rights, and as judge of the common pleas in the same year permitted no stamped paper to be used in his court. About 1771 he began to practise law in Philadelphia, although retaining a Delaware residence, and from Delaware, in 1774, he was elected to the Continental Congress, in which he served nine years, including the entire period of the Revolution, and took a prominent part in its proceedings, being president of the Congress in 1781. He was not present at the signing of the Declaration of Independence, which he had advocated, but added his signature some years afterward. The Articles of Confederation, which he aided in drafting, were also signed by him. In Pennsylvania, where he had become well known, he was made chairman of the Committee of Safety in 1776, and from 1777 to 1799 was chief justice of the State. He became a strong supporter of Jefferson, and a leader of the Republican party of that day, and was governor of Pennsylvania from 1779 to 1808. With James Wilson he wrote ‘Commentaries on the Constitution of the United States’ (1790).

McKean, Thomas, American philanthropist: b. Philadelphia, Pa., 23 Nov. 1842; d. there 16 March 1898. In 1862 he was graduated at the University of Pennsylvania and entered upon a successful business career, becoming an officer in many railroad and financial corporations. He acquired a large fortune, which he spent freely in endowing educational and charitable enterprises, his various gifts to the University of Pennsylvania alone amounting to $300,000.

McKean, William Vincent, American editor: b. Philadelphia 15 Oct. 1820; d. there 29 March 1903. He was a type-founder's apprentice in 1836–46, held a government post in Philadelphia in 1846–50, studied law and was associate of John W. Forney (q.v.) in the editorship of ‘The Pennsylvanian’ in 1850–3. In 1853–6 he was chief-clerk and disbursing officer of the House of Representatives, and became secretary to James Buchanan. He was editor-in-chief of the Philadelphia *Inquirer* 1860–4, and from 1864 until 1891 editor-in-chief and general manager of the *Public Ledger.*

McKees (mạ-kēz′) **Rocks,** Pa., borough, in Allegheny County; on the Ohio River, and on the Pittsburg, C. & Y., and the Pittsburg & L. E. R.R.'s; opposite the city of Allegheny. The first permanent settlement was made about 1830 by John McKee. It was incorporated as a borough in 1892. It is situated in a bituminous coal region, and in the vicinity of a fertile agricultural section. The chief industrial establishments are railroad shops, iron and steel works, car works, wire mills, tannery, chain works, rolling-mills, glassworks, flour and lumber mills. The shops and mills employ about 5,500 men. The borough has nine churches, four public and two parish schools. The principal public buildings are the churches, schools, a Y. M. C. A. building, and a hospital. There are three banks having a combined capital of $325,000; and the business transacted amounts annually to over $1,000,000. The government is vested in a burgess and a council of seven members. There are a number of foreign-born inhabitants, chiefly Germans, Hungarians, Italians, and Russians; the native born predominate. Pop. (1890) 1,687; (1900) 6,352. A large number of the employees in the machine shops and steel works reside outside the borough limits.

JOHN E. SCHRAMM,
Editor McKees Rocks ‘Gazette.’

McKeesport, Pa., city, in Allegheny County; at the junction of the Monongahela and the Youghiogheny rivers, and on the Pennsylvania, the Pittsburg & L. E., and the Baltimore & O. R.R.'s; about 10 miles southeast of Pittsburg. The first permanent settlement was made in 1795 by David McKee, after whom the place was named. It was only a small village until 1829, when coal mining began on an extensive scale. It was incorporated as a borough 3 Sept. 1842, and chartered as a city 1 April 1890.

McKeesport is situated in a region noted for its extensive fields of bituminous coal and its natural gas. The chief industrial establishments are steel and iron works, one of which, the National Tube Company, has 10,000 employees. There are about a dozen smaller establishments; railroad shops, glass works, locomotive works, and others, all together employing about 8,000 men. The city has a large trade in its own manufactures and in coal and lumber. The principal educational institutions are the public and parish schools, the Douglass Industrial College, the Gessley Business College, and the Carnegie Library. Some of its principal buildings are those of the schools mentioned (the high school cost about $168,000), the Young Men's Christian Association Hall, and 30 churches. There are 18 different religious denominations and 40 congregations in the city.

There are five banks, the combined capital of which is $1,100,000. The city officials are a mayor, who holds office three years, a council composed of 11 select and 22 common council members. The select members hold office four years, the common council members are elected every two years. The mayor appoints, subject to approval of the council, the board of health, the police and the street commissioners. The council elect the chief of the fire department, the water commissioners, and the city solicitor, and the board of education, the board of assessors, the treasurer, and comptroller are chosen by popular election.

The city owns and operates the waterworks. The annual municipal expenditures are about $320,000; the chief items of expense are, for schools about $155,000; waterworks, $55,000; police department, $55,000; fire department, $35,000. Pop. (1890) 20,741; (1900) 34,227. A large number of the people are foreign born, chiefly from Austria, Sweden, Germany, and Italy; but the native born predominate.

A. N. LAWSON,
Managing Editor ‘Daily News.’

MacKellar, mạ-kĕl′ar, **Thomas,** American poet: b. New York 12 Aug. 1812; d. 29 Dec. 1899. Having learned the printer's trade in the publishing house of the Harpers, he went to Philadelphia as a proofreader in the stereotype foundry of Lawrence Johnson & Co., in time became a partner in the business, and finally its head, the new firm being styled MacKellar, Smiths & Jordan. Among his works may be mentioned: 'Droppings from the Heart' (1844); 'Tam's Fortnight Ramble' (1847); 'The American Printer' (1866); 'Rhymes Atween-Times,' containing 'Let Me Kiss Him for His Mother' (1873); and 'Hymns and Metrical Psalms' (1883).

McKelway, Saint Clair, American journalist: b. Columbia, Mo., 15 March 1845. In 1853 he came east and was educated in New Jersey, studied law and was admitted to the bar in New York in 1866, but never practiced. In 1868 he became Washington correspondent for the New York *World* and the Brooklyn *Daily Eagle,* and in 1870 a member of the editorial staff of the latter paper. From 1877 to '84 he was the editor of the Albany *Argus,* and in the latter year returned to Brooklyn to become editor-in-chief of the *Eagle,* which under his editorship maintained a high standard of excellence. He has been a regent of the University of the State of New York since 1883, a member of the historical societies of Long Island and Suffolk County, is director of the American Social Science Association; and lectures frequently on educational and political subjects.

McKendree, mạ-kĕn'drĭ, **William,** American Methodist bishop: b. King William County, Va., 6 July 1757; d. near Nashville, Tenn., 5 March 1835. He served in the Continental army during the American Revolution, entered the Methodist ministry in 1787 and became a presiding elder nine years later. In 1801 he made a missionary tour beyond the Alleghanies and was an important factor in the evangelizing of that region. In 1808 he was elected bishop, being the first American born person to hold that office in the Methodist church. McKendree College (q.v.) was named in his honor. Consult 'Life' by Paine (1869).

McKendree College, in Lebanon, Ill., founded in 1828 under the auspices of the Methodist Episcopal Church, and first called Lebanon Seminary. In 1830 the name was changed, in honor of William McKendree, who gave his estate to the college. In 1839 a new charter was obtained whereby the school was granted university privileges. Abraham Lincoln rendered valuable services in securing the new charter. Students are admitted on certificates from approved schools or on examinations. It has classical, scientific, music, law, and graduate departments. The degrees to which the courses lead are A.B. and B.S. In 1903 there were connected with the school 12 professors, and 150 students in the academic and college departments, and 80 students in music. The library contained about 12,000 volumes. The endowment fund was about $50,000, and the annual income $6,500. The estimated value of the college grounds and buildings was nearly $70,000.

McKenna, mạ-kĕn'ạ, **Joseph,** American jurist: b. Philadelphia 10 Aug. 1843. In 1855 he went to California and was graduated from the Benicia Collegiate Institute in 1865, and admitted to the bar the same year. He was district attorney of Solano County in 1866–8, and in the sessions of 1875 and 1876 served as a Republican in the lower house of the California legislature. In 1885–93 he was a California representative in the 49th, 50th, 51st and 52d Congresses, resigning from the House in 1893 to accept the appointment to the office of United States circuit judge in the 9th Federal judicial district. This post he resigned to become attorney-general in the cabinet of President McKinley in 1897. On 16 Dec. 1897 he was made an associate justice of the United States Supreme Court to succeed Justice Field, retired, and on 26 Jan. 1898 took his seat. As circuit judge at San Francisco McKenna displayed much skill in the exposition of international law and the construing of treaties.

Mackenzie, mạ-kĕn'zĭ, **Sir Alexander,** Scottish explorer: b. Inverness, Scotland, 1755; d. near Dunkeld 12 March 1820. He went to Canada when young, where he entered the employ of the Northwest Fur Company. In 1789 he explored the great river named after him from the western end of Great Slave Lake to the Arctic Ocean, made another expedition to the western coast (1792), and was the first white man to cross the Rocky Mountains and reach the Pacific coast. He returned to Britain in 1801, and for his explorations received the honor of knighthood in 1802. He published 'Voyages from Montreal through the Continent of North America to the Frozen and Pacific Oceans in 1789 and 1793.'

Mackenzie, Alexander, Canadian statesman: b. Logierait, Perthshire, Scotland, 28 Jan. 1822; d. Toronto, Ontario, 17 April 1892. He emigrated to Canada in 1842. For five years he worked at the trade of a stonemason at Kingston, but then removed to Sarnia, where he became a contractor. But his chief interests were commercial, not political. In 1852 he began the Lambton 'Shield,' and soon became conspicuous as one of the Liberal leaders. He entered the Canadian Parliament in 1861, and after the Confederation of Canada, in 1867, sat both in the Ontario legislature at Toronto and in the Dominion Parliament at Ottawa. When the Hon. Edward Blake (q.v.) became prime minister of Ontario, in 1871, Mackenzie joined his cabinet, and became provincial treasurer, but, in consequence of a law forbidding membership of more than one legislature, he elected in 1872 to sit in the Dominion Parliament. In 1873, when the government of Sir John Macdonald was overthrown, Mackenzie, now the leader of the Liberal party, became prime minister of Canada, and held office for five years. His administration of public affairs was marked by rigid integrity. He himself took the great spending department of public works, and contractors found in him a vigilant watchdog of the treasury. His too great devotion to the details of his office broke down his health. In 1878 his government was defeated by the advocates of protection, and in 1880 he was obliged by ill-health to hand over the leadership of the Liberal party to Mr. Blake. Though he remained in Parliament for some years, he was never again able to take a prominent part in public affairs.

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Mackenzie, Alexander Slidell (originally Slidell), American naval officer: b. New York 6 April 1803; d. Tarrytown, N. Y., 13 Sept. 1848. He was a brother of John Slidell (q.v.) and assumed the name "Mackenzie" for an uncle in 1837. He entered the navy in 1815 and became a commander in 1841. While in command of the Somers the next year a mutiny among the naval apprentices on board was supposed to have been detected, and three of them, including a son of the secretary of war, were hung from the yardarm on 1 Dec. 1842. Mackenzie's summary action in the affair was bitterly criticised, but he was acquitted of blame by court-martial, though attacks upon him continued for the rest of his career. He was a popular writer, and among his works are: ‘A Year in Spain by a Young American’ (1829–1831; enlarged ed. 1836), which attained great popularity in England and the United States; ‘Popular Essays on Naval Subjects’ (1833); ‘The American in England’ (1835); ‘Life of John Paul Jones’ (1841); etc. Consult: ‘The Case of the Somers: defense of A. S. Mackenzie’ (1843); J. F. Cooper, ‘The Cruise of the Somers’ (1844).

Mackenzie, Henry, Scottish novelist and essayist: b. Edinburgh 25 Aug. 1745; d. there 14 Jan. 1831. He was a lawyer at Edinburgh; and in 1771 published anonymously ‘The Man of Feeling’ (1771), which gained him a conspicuous place among 18th century writers. Other novels of his are ‘Man of the World’ (1773); and ‘Julia de Roubigné’ (1777). He edited ‘The Mirror’ 1779–80, and ‘The Lounger’ 1785–87, papers on the plan of ‘The Spectator.’ His home in Edinburgh was long the resort of the most prominent persons in literature and politics in Scotland.

Mackenzie, Sir Morell, English laryngologist: b. Leytonstone, Essex, 7 July 1837; d. London 3 Feb. 1892. He was educated at the London Medical College, Paris and Vienna. In 1859 he met Czermak in Budapest and learning from him the use of the laryngoscope he introduced its use into London. Later he became physician to the London Hospital, and lecturer on diseases of the throat. In 1863 he founded the Throat Hospital in London. In 1887–8 he was associated with specialists of Berlin and Vienna in the treatment of the larynx disease of the Crown Prince, subsequently Emperor Frederick of Germany, and for these services was knighted by Queen Victoria, and received the Grand Cross and Star of the Hohenzollern Order of Germany. He was the author of ‘The Use of the Laryngoscope’ (1866); ‘Diseases of the Throat and Nose’ (1880); etc.

Mackenzie, Ranald Slidell, American soldier: b. Westchester County, N. Y., 27 July 1840; d. Staten Island, N. Y., 19 Jan. 1889. He was son of Alexander S. Mackenzie (q.v.). Graduated from West Point in 1862, he was assigned to the engineer corps, was wounded at Manassas and brevetted 1st lieutenant for services in that action. He was engineer of Sumner's division at Fredericksburg (13 Dec. 1862), and received the successive brevets of captain and major for his conduct at Chancellorsville and Gettysburg. Promoted captain of engineers 6 Nov. 1863, he took part in the Richmond campaign as commander of the 2d Connecticut artillery. On 18 June 1864 was brevetted lieutenant-colonel for services in the Petersburg siege, and commanded the 2d Connecticut heavy artillery in the Shenandoah campaign. He was present at Lee's surrender at Appomattox (9 April 1865), and was mustered out of the volunteer service 15 Jan. 1866. Throughout the war he participated in numerous other battles and was frequently employed in the construction of works of military engineering. In 1882 he was made brigadier-general, and in 1884 placed on the retired list.

Mackenzie, Robert Shelton, American miscellaneous writer: b. Drews Court, County Limerick, Ireland, 22 June 1809; d. Philadelphia 30 Nov. 1880. He came to the United States in 1852 and settling in Philadelphia was long prominent there in literary circles. Among his works are: ‘Lays of Palestine’ (1828), ‘Titian: A Venetian Art-Novel’; ‘Life of Guizot’ (1846); ‘Life of Charles Dickens’ (1870); ‘Sir Walter Scott· The Story of his Life’ (1871). He edited the ‘Noctes Ambrosianæ’ (1854).

Mackenzie, William Douglas, American Congregational clergyman; b. Fauresmith, Orange River Colony, South Africa, 16 July 1859. He was graduated from Edinburgh University in 1881. studied divinity in Edinburgh and Göttingen and is now professor of theology in the Chicago Theological Seminary. He has published ‘Ethics of Gambling’ (1893); ‘The Revelation of the Christ’ (1896); ‘Christianity and the Progress of Man’ (1897); ‘South Africa: its History, Heroes and Wars’ (1900).

Mackenzie, William Lyon, Canadian journalist and political reformer: b. Dundee, Forfarshire, Scotland, 12 March 1795; d. Toronto 28 Aug. 1861. In 1820 he came to Canada, and conducted a drug and book store at Little York (now Toronto), and later at Queenstown, where in 1824–6 he published the ‘Colonial Advocate.’ He transferred the ‘Advocate’ office to Toronto in 1826, and there continued the paper until 1833, attacking the office-holding class and demanding governmental reforms. In 1828 he entered the provincial parliament; and having been expelled for alleged libel against that assembly, was five times re-elected and as often re-expelled, until the government refused to issue another writ of election. In 1832 he went to England, and having presented to the home government a petition of grievances from the Canadian reformers, was successful in obtaining the dismissal of the attorney-general and the solicitor-general of Upper Canada and the veto of the Upper Canada bank bill. In 1834 he was elected first mayor of Toronto, in 1836 began the publication of ‘The Constitution,’ and, in 1837 published in that journal a bold manifesto which was practically a declaration of independence of the provincial government. Soon afterward he undertook armed rebellion. An encounter took place between his followers and the government forces at Montgomery's hill, in the vicinity of Toronto (7 Dec. 1837), and the insurgents fled to Navy Island in the Niagara, where they were joined by about 500 Americans. The island was bombarded by Canadian royalists, and as a result of this and the strong opposition of General Scott of the United States army, the insurgents broke camp and Mackenzie was imprisoned for a year in Rochester jail. Later he was a journalist in the United States, in 1849 took advantage of the amnesty to return to Canada, was there a member of parliament in 1850–8, and at Toronto published the weekly ‘Mackenzie's Messenger’ from 1858 until shortly before his death. The reforms for which he so persistently contended have since been achieved. He wrote: ‘Sketches of Canada and the United States' (1833). Consult the 'Life' by Lindsey (1862); Dent, 'Story of the Upper Canadian Rebellion' (1885); Read, 'The Canadian Rebellion of 1837' (1896).

Mackenzie, Canada, a district in the Northwest Territories, bounded north by the Arctic Ocean, east by Keewatin, south by Athabasca, and separated on the west from Yukon, by the northernmost spur of the Rocky Mountains. The district created in 1895 and administered by the government of the Northwest Territories, is the largest in Canada, having an estimated area of 563,200 square miles, of which 82,000 square miles are water. The surface generally is diversified; in the northwest it is a sterile waste; along the river valleys and on the western mountain slopes it is well forested with fir, pine, spruce, and other northern trees, while coal and other minerals, although unexploited, are found. The chief rivers are the Mackenzie, the Coppermine, and the Great Fish or Black River (qq.v.). The soil is comparatively unproductive, the climate being arctic and inhospitable except for the few summer months. The population (1901) 5,216, inhabit the trading settlements of the Hudson's Bay Company, along the Mackenzie and its tributaries. The pelts of the fur-bearing animals of the region are practically the only developed item of commerce.

Mackenzie River, Canada, a large river in the Northwest Territories, which flows from the Great Slave Lake, and after a northwesterly course of about 1,000 miles, enters the Arctic Ocean by numerous mouths at the island-studded Mackenzie Bay. Its tributary head-streams are the Great Peace River, which rises in British Columbia beyond the Rocky Mountains, and the Athabasca or Elk River, which has its source in the Rockies; these two rivers flowing into Lake Athabasca are discharged by the Great Slave River into Great Slave Lake, whence issues the Mackenzie. The principal affluent of the Mackenzie is the Liard or Mountain River. With the exception of a slight obstruction in the rapids near Fort Good Hope, in lat. 66° N., the Mackenzie and its tributaries are navigable for a distance of over 1,800 miles, and from June to October steamboats of the Hudson's Bay Company ply from Great Slave Lake almost to the Arctic Ocean. Forts Providence, Norman, and Good Hope are trading stations along its banks, while Forts McPherson, Franklin, Enterprise, Reliance, Resolution, Chippewyan, Nelson, and Graham are along its tributaries. The valley is well-wooded with spruce, pine, poplar, and birch, while coal, salt and other minerals abound in the region. The river is named after Alexander Mackenzie (q.v.), who first explored it in 1789.

Mackerel, măk'ĕ-rĕl. The common mackerel (*Scomber scombrus*) is the best known and most important member of the family *Scombridæ* and one of the most valuable of food-fishes, ranking in this respect behind the cod and herrings only. The mackerel is a compactly built fish of smooth and regular outline, the fusiform figure tapering accurately to the pointed snout, so that it cleaves the water easily. The large, deeply-forked tail is supported on a slender peduncle, provided with two small keels on each side, and preceded by a dorsal and a ventral series of finlets of five each. A soft dorsal and a counterpart anal fin are placed exactly opposite each other and behind the level of the vent, and the anterior dorsal fin is supported by usually 11 delicate spines. Very numerous and small scales cover the body nearly uniformly, but are absent from the head. The large mouth is provided with numerous small sharp teeth. The gill-rakers are long and the air-bladder is wanting. The color of the back is deep blue, marked by about 35 nearly vertical wavy black lines; below, the fish is silvery white. A recent close study of the species on the European side of the Atlantic establishes the existence there of local races, as in the herring, but it appears that the American representatives, while constituting a race distinct from the European, are more homogeneous.

The mackerel is an abundant fish on both sides of the North Atlantic, on the American side ranging from Cape Hatteras to the Straits of Belle Isle, and on the European from northern Norway to the Canary Islands and throughout the Mediterranean. While a true pelagic fish of wandering and migratory habits and, like most such, capricious in its movements, the great body of mackerel approaches the American coast and moves along it northward as the temperature of the water rises to about 45° F. On the approach of winter they retire to a greater distance from the land, but a few remain throughout the year near the coast. Mackerel swim in great schools at or near the surface; one such covering an area of 10 square miles, and another estimated as containing 1,000,000 barrels, have been observed. The local movements of the schools are largely regulated by the food-supply, which consists of small pelagic fishes, various kinds of small crustaceans, etc., which are pursued with great eagerness. On the other hand, the bluefish and other carnivorous fishes, porpoises, squids and fish-eating birds, are relentless enemies. Spawning takes place in the open sea, not far from the coast, from Vineyard Sound to the Gulf of St. Lawrence, and during the months of May, June and early July. The eggs are about one millimetre in diameter, contain an oil-drop and float at the surface, where the young fish develop and live. They grow rapidly and are about five inches long by the end of the first half year, when they are known as "spikes"; "blinkers" are about one year old and six or seven inches long; "tinkers" are seven to nine inches long and are supposed to be two years old. At the age of three or four years the mackerel is mature and from 12 to 18 inches long. The very largest specimens weigh about four pounds and have a length of 22 to 23 inches.

The mackerel fishery is of the greatest importance in the New England States and Nova Scotia, and in Norway, Ireland and Great Britain. In Europe the fishery is prosecuted almost exclusively by means of small boats and hand lines, but in America is chiefly carried on in staunch sea-going schooners, most of which hail from Gloucester, Mass., and which are equipped with purse-seines, by means of which entire schools are surrounded and captured. The fishing begins off Cape Hatteras in March or April and the schools are followed northward as they appear successively on the New Jersey, New England and Canadian coasts. In addition to the operations of this mackerel fleet, local fisheries are carried on along much of the coast with pound-nets, gill-nets and hand-lines. The spring and local catches are generally sold fresh, the summer catch being split and salted. The product of the fishery has been peculiarly subject to fluctuations, due in large part to alternating periods of abundance and scarcity of the fish. Colonial writers refer to its great plenty, and statistics of the catch inspected in Massachusetts show a somewhat regular recurrence of such periods at intervals of about 20 years. From 350,000 barrels in 1880 and 395,000 in 1881, the catch has steadily declined to 75,000 in 1886, and 18,000 in 1891, since which time it has sometimes been larger, sometimes smaller, but an abundance of young fish and other signs may indicate the approach of another period of plenty. The number of vessels employed in 1903 was about 250, or less than one fourth what it formerly was. In 1901 the total value of the mackerel, both fresh and salted, landed at Gloucester and Boston, was $713,100.

An elaborate account of the American mackerel fishery will be found in Brown-Goode's ‹Materials for a History of the Mackerel Fishery,› Report U. S. Fish Com. (1884); for some recent views see Moore, ‹Report National Fishery Congress› (Washington, 1898); and for methods of preservation, Stevenson, ‹The Preservation of Fishery Products for Food,› Bull. U. S. Fish Com. (1898).

Mackerel Shark, or **Porbeagle**, a shark of the family *Lamnidæ*, allied to the man-eater (q.v.), and like it sometimes called blue shark, on account of its color, which is frequently seen on both sides of the northern Atlantic Ocean; it is the *Lamna cornubica* of ichthyologists. The ordinary length is about 10 feet, and they become very abundant in summer, when the mackerel are running, along the New England coast, and also about Great Britain, where they are called porbeagles. They are a nuisance to fishermen by destroying their nets, through which several will often tear their way (for they roam about in bands) in pursuit of captured fish. Formerly considerable quantities of oil were saved from their livers, but at present the value of this commodity does not pay for the trouble of taking them.

Mack'ey, Albert Gallatin, American writer on Freemasonry: b. Charleston, S. C., 12 March 1807; d. Fortress Monroe, Va., 20 June 1881. He was graduated from the Medical College of South Carolina in 1832 and was demonstrator of anatomy there in 1838, but after 1844 devoted himself to studies of Freemasonry and became a standard authority on the subject. Among his works are: ‹A Lexicon of Freemasonry› (1845); ‹The Mystic Tie› (1849); ‹Book of the Chapter› (1858); ‹A Manual of the Lodge› (1862); ‹A Text-Book of Masonic Jurisprudence› (1869); ‹Encyclopædia of Freemasonry› (1874).

McKibbin, mą-kĭb'ĭn, **Chambers**, American soldier: b. Pittsburg, Pa., 2 Nov. 1841. He enlisted as a private in the volunteer service 22 Sept. 1862, was brevetted captain for gallant services in the battle of North Anna River (Va.) and in the operations on the Weldon railway, and on 1 May 1896 attained the rank of lieutenant-colonel of the 21st United States infantry. At the beginning of the war with Spain he went to Cuba with Shafter's army, fought at Santiago (1 July 1898), and was made brigadier-general of volunteers and appointed military governor of Santiago. On 12 May 1899 he was mustered out of the volunteer service, and on 6 June 1899 assumed command of the department of Texas with rank of colonel of infantry (commissioned colonel 12th United States infantry 1 April 1899).

Mackie, Pauline Bradford. See Hopkins, Pauline Bradford.

McKim, mą-kĭm', **Charles Follen**, American architect: b. Chester County, Pa., 24 Aug. 1847. He studied at the Lawrence Scientific School in 1866, at the Beaux-Arts of Paris in 1867–70, and shortly afterward entered into partnership with Stanford White and William R. Meade. This firm became known in connection with some of the finest triumphs of recent American architecture. Among notable examples of its work are the buildings of Columbia University, and the Public Library of Boston. In 1903 McKim received the royal gold medal from the Royal Institute of British Architects in recognition of his services to architecture. He is the second American to obtain this honor, R. M. Hunt (q.v.) having been the first. On the occasion of the presentation he made an able speech reviewing the progress of his profession in the United States. He was elected president of the American Institute of Architects.

McKim, James Miller, American abolitionist: b. near Carlisle, Pa., 14 Nov. 1810; d. Llewellyn Park, West Orange, N. J., 13 June 1874. He was graduated from Dickinson College (Carlisle, Pa.) in 1828, studied medicine at the University of Pennsylvania and theology at Princeton (1831) and Andover (1832), and in 1835 was ordained a Presbyterian pastor in Womelsdorf, Pa. An original member of the American Anti-Slavery Society, he became its lecturing agent in October 1836, and spoke throughout Pennsylvania, often at great personal danger. In 1840 he removed to Philadelphia, where he was publishing agent of the Pennsylvania Anti-Slavery Society and later corresponding secretary until 1862. In November 1862 he called a public meeting in Philadelphia to provide for 10,000 slaves suddenly liberated by the capture of Port Royal, S. C. As a result, the Philadelphia Port Royal relief committee was formed. This committee was expanded in November 1863 into the Pennsylvania Freedman's Relief Association, of which McKim became the corresponding secretary. In that capacity he was active in the establishment of negro schools in the South. In 1865–9 he was corresponding secretary of the American Freedman's Commission, which on his motion was disbanded in July 1869. In 1865 he assisted in founding and became a proprietor of the New York weekly ‹Nation.› During the Civil War he was an advocate of the enlistment of negro troops, and as a member of the Union League of Philadelphia assisted in the recruiting of 11 colored regiments.

McKim, Randolph Harrison, American Episcopal clergyman: b. Baltimore 15 April 1842. He was graduated from the University of Virginia, served in the Confederate army 1851–65, subsequently entered the Episcopal ministry, and after holding rectorships in Portsmouth and Alexandria, Va., and those of Holy Trinity, Harlem, N. Y., and Trinity, New Orleans, became rector of Epiphany Church, Washington, D. C., in 1889. He has published: 'A Vindication of Protestant Principles' (1879); 'Future Punishment' (1883); 'Present Day Problems of Christian Thought' (1900); etc.

Mackinac (măk'ĭ-năk or măk'ĭ-nâ) **Island,** Mich., in Mackinac County, at the entrance to Straits of Mackinac, in the northwest part of Lake Huron; about 255 miles north by west of Detroit. The island is about three miles long and two wide. It is rocky, and covered with trees, shrubs, and flowers. Its cool climate in summer, and the scenery make it a favorite summer resort. The island has been prominent since the early missionaries and explorers mentioned it in connection with its command of the channel entering the Straits. The city of Mackinac (the post-office is Mackinac Island), on the southeast shore, was chartered in 1900. On a hill just back of the city is Fort Mackinac. Pop. of the city (1900) 665.

Mackinaw Trout. See LAND-LOCKED SALMON.

McKinley, mạ-kĭn'lĭ, **William,** American statesman, 25th President of the United States: b. Niles, Trumbull County, Ohio, 29 Jan. 1843; d. Buffalo, N. Y., 14 Sept. 1901. He was educated at Union Seminary, Poland, Mahoning County, Ohio, and Allegheny College (Meadville, Pa.) (1860–1), was forced by illness to discontinue his college course, taught in the public schools, was a clerk in the Poland post-office, and on 11 June 1861 enlisted for the Civil War as a private in company E of the 23d Ohio volunteer infantry. His first battle was that of Carnifex Ferry (10 Sept. 1861), and on 15 April 1862, while in camp at Fayetteville, western Virginia, he was promoted commissary sergeant. For conspicuous service at Antietam (17 Sept. 1862) he was made 2d lieutenant of company D. His subsequent appointments were, 1st lieutenant company E (7 Feb. 1863), captain company G (25 July 1864), and brevet major (14 March 1865). When mustered out on 26 July 1865 he was acting assistant adjutant-general on the staff of General S. C. Carroll, commanding the veteran reserve-corps stationed at Washington. Among other actions in which he participated were those of South Mountain (14 Sept. 1862), Lexington (10 June 1864), Kernstown (24 July 1864), Opequan Creek (Winchester) (19 Sept. 1864), Fisher's Hill (22 Sept. 1864), and Cedar Creek (19 Oct. 1864). During his subsequent political career he was generally known, especially in Ohio, as Major McKinley. At the close of the war he began the study of law at Youngstown, Ohio (1865–6), continued it at the Albany (N. Y.) law school (1866–7), in March 1867 was admitted to the bar at Warren, Trumbull County, Ohio, and at once entered practice at Canton. In 1870–1 he was prosecuting attorney of Stark County, and during the campaign between R. B. Hayes and William Allen for the governorship of the State, spoke effectively against the «greenback» craze. He was elected to Congress as Republican representative from the 17th Ohio district in 1877, and served continuously in the 45th, 46th and 47th Congresses (1877–83). It was asserted by the Republicans that he was elected in 1882 to the 48th Congress by a majority of eight ballots; but, although he had received the certificate of election, his seat was successfully contested by J. H. Wallace, who was not, however, seated until June 1884. He represented the 20th district in the 49th Congress (1885–7), and the 18th in the 50th and 51st Congresses; but in 1890 was defeated in the 16th for the 52d Congress by 300 ballots by J. G. Warwick, Democrat, lieutenant-governor of the State a short time previously. His defeat was attributed to the gerrymandering of the district by a Democratic legislature. His service in Congress was notable. In 1877 he was appointed a member of the judiciary committee, and in December 1880 of the ways and means committee to succeed James A. Garfield; and in 1881 was chairman of the committee in charge of the Garfield memorial exercises in the House. In 1889–90 he was chairman of the ways and means committee. He was a candidate for speaker of the 51st Congress, but was defeated by T. B. Reed on the third ballot in the Republican caucus. He was known among the foremost orators of the House; and his speeches on arbitration as a solution of labor troubles (2 April 1886) and in support of the civil-service laws (24 April 1890) were most favorably received. But his principal efforts were made in connection with the tariff, which, from his first appearance in the House, was the chief object of his study. On 6 April 1882 he spoke in advocacy of protection; on 30 April 1884 in opposition to the Morrison tariff bill, making what was esteemed the ablest argument against that measure; and on 7 May 1890 in support of the general tariff bill, now known by his name, which, as chairman of the ways and means committee, he had introduced before the House on 16 April. The bill was passed by the House on 21 May, by the Senate on 11 September, and on 6 October became a law. His bill obtained for him an international reputation, and eventually the presidency. In 1884 he was delegate-at-large from Ohio to the Republican national convention at Chicago, where he supported Blaine's candidacy, and where, as chairman of the committee on resolutions, he helped to determine the platform of his party, which he read before the convention. In the Republican national convention at Chicago in 1888, he was again a delegate and chairman of the committee on resolutions. He supported the candidacy of John Sherman, although, when it was finally learned that Blaine would decline the nomination, he was himself the choice of many delegates and was strongly urged to permit the use of his name. At the Minneapolis convention of 1892 he was once more a delegate and was elected permanent chairman of the assembly. He supported the renomination of President Harrison, and though refusing the use of his own name, received the ballots of 182 delegates. He then left the chair and moved to make Harrison's nomination unanimous, which was accordingly done. In the ensuing campaign he took a very active part, traveling, it was estimated, more than 16,000 miles and speaking to more than 2,000,000 voters. In 1892–6 he was governor of Ohio, having been elected in 1891 by 21,500 plurality, and in 1893 by the unusual plurality of 80,995. Labor riots occurred during his administration, necessitating the placing of 3,000 militia troops in active service, but the difficulties were successfully adjusted. McKinley also personally directed the relief work for the

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WILLIAM McKINLEY.

TWENTY-FIFTH PRESIDENT OF THE UNITED STATES.

starving miners of the Hocking Valley district. He was nominated for the presidency by the Republican national convention which met at St. Louis 16 June 1896, and was elected by a plurality of 601,854 over W. J. Bryan, receiving a popular vote of 7,104,779, and in the electoral college a vote of 271 to 176 for Bryan. Throughout the campaign he remained in Canton, where he made over 300 speeches to more than 750,000 visitors. Under his administration decided increase in business prosperity followed the passage of the Dingley tariff measure. The most important event of his term was the Spanish-American war (q.v.), which he had believed might be prevented and had done all in his power to avert. When hostilities broke out on the part of certain inhabitants of the Philippine Islands, the President appointed a commission to study the situation and report on the most suitable mode of government for the new territory. On 7 July 1898 he approved the joint resolution of Congress for the annexation of the Hawaiian Islands, and in 1898 he also selected a delegation to represent the United States in the Hague peace conference which convened in May 1899. The original Philippine commission having rendered a report (31 Jan. 1900), the President appointed a new commission, known from its head, Judge W. H. Taft, as the Taft commission, under whose direction civil government was instituted in the islands on 1 Sept. 1900. (See Philippines, *History.*) In 1900 the President stood conspicuously for justice in the settlement of the difficulties in China which marked that summer. He was renominated for the presidency by the Republican national convention which met at Philadelphia on 25 June 1900, receiving the entire vote of the 930 delegates. He was elected by a popular vote of 7,206,677 to 6,374,397 for W. J. Bryan, receiving it is said, the largest popular majority ever given a candidate for the presidency. He obtained 292 electoral votes and carried 28 States. On 5 Sept. 1901 he delivered at the Pan-American Exposition, Buffalo, N. Y., an important address, summarizing at once the problems then before the nation and his policy for their solution. On 6 September, while holding a reception in the Music Hall of the Exposition, he was twice shot by Leon Czolgosz (q.v.), an anarchist. He died on 14 September; and 19 September was appointed by his successor, President Roosevelt, a day of mourning and prayer throughout the United States. Unprecedented honors were paid to McKinley's memory in foreign capitals, notably in London, where memorial services were held in Westminster Abbey and St. Paul's Cathedral. For five minutes on the day of the funeral all motive power in the United States remained still. Consult: Smith (editor), 'Speeches and Addresses of William McKinley' (1893); Porter, 'The Life of Major McKinley' (1896); and 'Speeches and Addresses of William McKinley from 1897 to 1901' (1900). See also United States, *History*.

McKinley Act, a name popularly given to a tariff bill reported to Congress, 21 May 1890, by the Ways and Means Committee of the House of Representatives, of which William McKinley was chairman. It became a law in October 1890, and was repealed in 1894. It increased the duties on wool, woolen manufactures, on tin-plate, barley, and some other agricultural products, and remitted the duty on raw sugar. The reciprocity feature was an important part of the bill, providing for the remission of duty on certain products from those countries which should remove duties on American imported products. See Tariff.

McKinley, Mount, United States, a peak of the Rocky Mountains, the highest in North America, south of the central part of Alaska; about 155 miles north of Cook Inlet. The Indian name for this peak is Traleyka, and the Russian name, Bolshaya. The fact that this is the highest land on the continent was not known till 1896 when Mr. Dickey explored the Sushitna River and the land near its source. He estimated the height of the peak at 20,000 feet, and named it McKinley, in honor of William McKinley (q.v.). In 1903 it was visited by members of the United States Geological Survey. The mountain is a great dome-shaped mass, over 20,000 feet above the sea.

McKinney, ma-kĭn'ĭ, Texas, city, county-seat of Collin County, on the Missouri, K. & T. and the Houston & T. C. R.R.'s; about 30 miles north by east of Dallas. It is situated in a rich agricultural region, in which cotton is cultivated quite extensively. The chief industrial establishments are cottonseed-oil mills, cotton gins, cotton compresses, wagon and carriage shops, and flour mills. It is the seat of the McKinney Collegiate Institute. The court-house is a fine building and cost $100,000. The waterworks are owned and operated by the city. Pop. (1890) 2,489; (1900) 4,342.

Mackintosh, măk'ĭn-tŏsh, Sir **James**, Scottish historian and philosophical writer: b. Aldourie, Aberdeenshire, 24 Oct. 1765; d. London 30 May 1832. He was educated at Aberdeen and Edinburgh; studied medicine and took the M.D. degree in 1787; published his 'Vindiciæ Gallicæ' in answer to Burke's 'Reflections on the French Revolution'; quitted the medical profession and was called to the English bar in 1795. By reason of his brilliant lectures on the 'Law of Nature and Nations,' and his defense of Peltier, who was prosecuted for a libel on Napoleon Bonaparte, he acquired fame at the bar, was knighted, and in 1804 appointed recorder of Bombay. After an honorable career in India he returned to England; entered Parliament for Nairn, and afterward for Naresborough; was professor of law at Haileybury College (1818–24), a member of privy council, and in 1830 commissioner of Indian affairs. Among his writings may be mentioned his 'History of England,' a fragment extending only to the reign of Elizabeth; 'Dissertation on the Progress of Ethical Philosophy' in the Encyclopædia Britannica; a 'Life of Sir Thomas More' in Lardner's Cyclopædia; and nine chapters of an unfinished work on the revolution of 1688.

Mackintosh, a water-proof overcoat, or outer garment, one of the products of modern rubber manufacture. It derives its name from the inventor. See India Rubber.

Macklin, măk'lĭn, **Charles**, Irish actor and dramatist: b. Ireland 1 May 1697; d. London 11 July 1797. He was the son of an Irish gentleman named McLaughlin and in 1733 appeared in minor parts at Drury Lane, London. He steadily rose in public favor, till 1741 he appeared in his greatest role, Shylock. He was accounted from this period among the best actors of the time. His last performance was at Covent Garden in May 1789, at past the age of 90. In 1735 he accidentally killed a brother actor in a quarrel and was tried for murder; and was frequently afterward engaged in disputes and actions at law. Of his own plays only ‘The Trueborn Irishman’; ‘Love a-la-Mode’ (1759); and ‘The Man of the World’ (1781) have been printed. Consult ‘Life’ by Parry (1891).

Maclagan, William Dalrymple, English archbishop: b. Edinburgh 1826. He was educated at Edinburgh and was graduated in mathematical honors at Cambridge University. He served in the Indian army (1847–52); was ordained deacon (1856) and priest (1857). He was appointed bishop of Lichfield (1878) and archbishop of York in 1891. He has published ‘Pastoral Letters and Synodal Classes’ (1891).

McLane, măk-lăn', **Allan,** American soldier and jurist: b. 8 Aug. 1746; d. Wilmington, Del., 22 May 1829. In 1774 he settled in Kent County, Del., and in the Revolution he took a prominent part. He became a lieutenant in Thomas Rodney's regiment of Delaware militia, attained colonel's rank, and at the close of the war was appointed judge of the Delaware court of appeals. In 1790–8 he was United States marshal of Delaware under Washington's appointment, and from 1808 until his death, collector of Wilmington (Del.) port. He also served in the Delaware legislature, being for a time speaker of the lower house.

McLane, Louis, American statesman: b. Smyrna, Kent County, Del., 28 May 1786; d. Baltimore 7 Oct. 1857. He was the son of Allan McLane (q.v.), and entered the navy at an early age, served as a midshipman under the elder Decatur. Quitting the navy in 1801 he studied law, was admitted to the bar in 1808, and rose to eminence in the profession. He represented Delaware in Congress, 1816–27, when he was chosen United States senator. In 1829–31 he was minister to Great Britain, and on his return home was made secretary of the treasury. In 1833 he declined to sanction the removal of the deposits from the United States bank, and was consequently transferred by the President to the State Department. He held the office of secretary of state till June 1834, when he resigned and retired from political life. In 1837 he accepted the presidency of the Baltimore & Ohio Railroad, which he held till 1847. In June 1845 he was appointed by President Polk ambassador to London during the Oregon negotiations, after the settlement of which he resigned. In 1850 he was a member of the convention to reform the constitution of Maryland.

McLane, Robert Milligan, American politician and diplomat: b. Wilmington, Del., 23 June 1815; d. Paris, France, 16 April 1898. He studied at the Collège Bourbon of Paris (1829–31), was graduated from West Point in 1837, took active part in the Seminole War in Florida (1837), and served under Gen. Scott in the Cherokee country (Georgia). He resigned from the army in 1843, and having already been admitted to the bar in the District of Columbia, began practice at Baltimore, Md. In 1847–51 he was a Democratic member of the House of Representatives in the 30th and 31st Congresses. In 1853 he was appointed commissioner, with powers of minister plenipotentiary, to China, Japan, Siam, Korea, and Cochin China; and from this mission he returned in 1856, having with Commodore Perry concluded important treaties. In 1859–61 he was minister to Mexico, in which capacity he signed the treaty of 1860. In 1861 he returned to Baltimore and there took a prominent part in the discussions attending the secession of the cotton States. He was one of the committee appointed by the Maryland legislature (May 1861) to confer with Lincoln in regard to alleged unconstitutional proceedings on the part of the Federal government within the State of Maryland. Upon the decision of the State legislature, based on the committee's report, that it was inexpedient for Maryland to secede, McLane retired from public affairs for a time. In 1877–8 he was State senator; in 1879–83 a representative in the 46th and 47th Congresses; and in 1883–5 governor of Maryland. He was minister to France in 1885–9 by appointment of President Cleveland.

Maclaren, mạ-klăr'ĕn, **Ian.** See WATSON, JOHN.

McLaren, William Edward, American bishop: b. Geneva, Ontario County, N. Y., 13 Dec. 1831; d. New York, 19 Feb. 1905. He was graduated at Jefferson College, 1851, ordained to the Presbyterian ministry, 1860, and entered that of the Protestant Episcopal Church in 1872. Three years later he was appointed bishop of Illinois; after the subsequent division of the diocese became bishop of Chicago. Among his writings may be mentioned ‘Catholic Dogma the Antidote of Doubt’ (1884).

McLaughlin, măk-lâk'lĭn, **Andrew Cunningham,** American historical writer: b. Beardstown, Ill., 14 Feb. 1861. He was graduated from the University of Michigan in 1882, from its law school in 1885, and has been professor of history in that university since 1891. He served as director of the bureau of historical research of Carnegie Institution, Washington, D. C., 1903–5, and was managing editor of the ‘American Historical Review,’ 1901–5. He has written ‘Lewis Cass’ in ‘American Statesmen’ series (1891); ‘History of Higher Education in Michigan’; ‘Civil Government in Michigan’ (1892); ‘History of the American Nation’ (1899); ‘The Confederation and the Constitution’ (1905); and edited Cooley's ‘Principles of Constitutional Law’ (1898).

McLaughlin, Mary Louise, American artist: b. Cincinnati. She began to decorate pottery in 1877 and made Losanti porcelain (1898), exhibiting for the first time in the Paris Exposition of 1900. She has been awarded several public honors for her work. Among her published writings are: ‘China Painting’; ‘Pottery Decoration’; ‘Suggestions to China Painters’; ‘Painting in Oil’; ‘The Second Madame.’

Maclaurin, măk-lâ'rĭn, **Colin,** Scottish mathematician and philosopher: b. Kilmodan, Argyleshire, February 1698; d. 14 June 1746. He was educated at Glasgow University, and in 1717 became professor of mathematics in Marischal College, Aberdeen, and two years after was chosen fellow of the Royal Society. In 1720 he published ‘Geometrica Organica,’ a work on curves. In 1725 he was elected professor of mathematics at Edinburgh, where his lectures contributed much to raise the character of that university as a school of science. A controversy with Bishop Berkeley led to the publication of Maclaurin's great 'Treatise on Fluxions' (1742). He also wrote a 'Treatise on Algebra'; 'Account of Sir Isaac Newton's Philosophical Discoveries'; etc.

MacLaws, măk-lâz′, **Lafayette,** American military officer: b. Augusta, Ga., 15 Jan. 1821; d. Savannah, Ga., 24 July 1897. He was graduated at West Point in 1842; served in the Mexican War till the surrender of Vera Cruz; and at the beginning of the Civil War was commissioned a brigadier-general in the Confederate army. He was promoted major-general 23 May 1862, and during the march of Sherman to the sea commanded the defenses of Savannah and had charge of the Military District of Georgia. He was appointed collector of internal revenue at Savannah in 1875 and postmaster there in 1876.

Maclay, ma-klā′, **Edgar Stanton,** American author: b. Foochow, China, 18 April 1863. He was graduated at Syracuse University in 1885; was reporter on the Brooklyn *Times,* 1886–90, and on the New York *Tribune,* 1891–3; served on the editorial staff of the *Tribune,* 1893–5, and on that of the New York *Sun,* 1895–6. In 1896 he was appointed light-house-keeper at Old Field Point, and in 1901 received an appointment at the New York Navy-Yard. He edited the 'Journal' of William Maclay (q.v.), and is the author of a 'History of the United States Navy,' which occasioned much controversy and brought about his dismissal from government employ, by order of President Roosevelt, in 1901. The ground of this action, following Maclay's refusal of an official request for his resignation, was a passage in the 'History' stigmatizing Rear-Admiral Schley as a «caitiff, poltroon, and coward» for his conduct in the naval fight off Santiago, Cuba, 3 July 1898. Maclay has also written 'Reminiscences of the Old Navy' and 'The History of American Privateers.'

Maclay, William, American soldier and politician: b. New Garden, Chester County, Pa., 1737; d. 1804. He was educated in his native place; was a lieutenant in the French and Indian War, taking part in the expedition against Fort Duquesne in 1758, and afterward serving under Gen. Bouquet. He studied law, was admitted to the bar, went to England on behalf of militia officers serving in the French and Indian War, to confer upon their claims for land-grants with the proprietors of Pennsylvania, and on his return became attorney to the Penn family. In the Revolution he raised troops and equipped them, was assistant commissary of purchase, and performed some field service. In 1781 he was elected to the Pennsylvania Assembly, afterward held other offices in the State, and with Robert Morris (q.v.) was elected to the United States Senate, they being Pennsylvania's first representatives in that body. His service there ended in 1791, but in the Senate he had shown deep-seated hostility to Washington and his administration, which was the chief distinction of Maclay's senatorial career. In his later years he was a member of the Pennsylvania legislature and his last public office was that of a county judge. Consult his 'Journal,' edited by Edgar Stanton Maclay (q.v.).

Macle, măk'l, in mineralogy, a variety of andalusite, occurring in long, tapering crystals in clay-slate. They have the axes and angles of a different color from the rest of the crystals, owing to a regular arrangement of impurities in the interior.

MacLean, George Edwin, American educator: b. Rockville, Conn., 31 Aug. 1850. He was graduated at Williams College in 1871 and at Yale Theological Seminary in 1874; from 1877 to 1881 was pastor at Troy, N. Y.; studied in Germany; and in 1883 became professor of English language and literature at the University of Minnesota. He was chancellor of the University of Nebraska, 1895–9, and since 1899 has been president of the University of Iowa. His writings include: 'A Chart of English Literature' (1892); 'Old and Middle English Reader' (1893); and 'A Decade of Development in American State Universities' (1898). He has edited: 'Ælfric's Anglo-Saxon Version of Alcuini Interrogationes Sigewulfi Presbyteri in Genesin' (1883); 'An Introductory Course in Old English,' by Wilkin and Babcock (1888); and 'An Old and Middle English Reader' by Zupitza (1889).

McLean, George P., American lawyer and politician: b. Simsbury, Conn., 7 Oct. 1857. He was for a time a reporter on the Hartford *Evening Post,* then studied law, and was admitted to the bar in 1881, and immediately commenced practice in Hartford. In 1883–4 he was a member of the General Assembly, where he soon became distinguished for facility in debate and was considered one of the leaders of the Republican party. In 1888 he was elected State senator, and in 1900 nominated by his party as governor of Connecticut and elected. Though he was not widely known at the time of his election, his independent position in regard to constitutional reform soon made him prominent; both in his first governor's message and before the constitutional convention, he advocated representation in the legislature according to population instead of by towns. Though in this he opposed certain elements in his own party, he gained support from a considerable number of Democrats and great personal popularity in the cities. In 1902 he was offered renomination, but declined, in 1903–4 he was a prominent candidate for United States Senator.

MacLean, John, American jurist and statesman: b. Morris County, N. J., 11 March 1785; d. 4 April 1861. He removed with his parents to Warren County, Ohio, in 1799, later went to Cincinnati, where he studied law, and was admitted to the bar in 1807, and commenced practice at Lebanon, Warren County, Ohio. He was a member of Congress 1812–16, and from 1816–22 judge of the supreme court of Ohio. In July 1823 he was appointed postmaster-general, the Post-office Department being then in a very disordered and inefficient condition. Under his administration this branch of the public service was restored to order, and managed with a vigor, method, and economy that soon secured an almost unexampled degree of applause and public confidence. In 1829 he became associate justice of the Supreme Court of the United States. In this capacity his charges to grand juries while on circuit are distinguished for ability and eloquence. In the Dred Scott case he dissented from the decision of the court as given by Chief Justice Taney, and expressed the opinion that slavery has its origin merely in power, and is against right, and in this country is sustained only by local law.

McLean, John, American educator: b. Princeton, N. J., 1800; d. there 1886. His whole life was spent in Princeton. He was graduated from the college there in 1816, became tutor in the institution in 1818, and was a member of the faculty till 1868, when he resigned the presidency, which he had held from 1854. He published ‹Lecture on a Common School System for New Jersey› (1829), which in later years had much influence in the establishment of such a system; ‹History of the College of New Jersey› (1877); etc.

McLean, Sarah Pratt. See GREENE, SARAH PRATT MCLEAN.

McLean, Simon James, American sociologist: b. Brooklyn, N. Y., 14 June 1871. He was graduated from the University of Toronto in 1894 and has been professor of economics and sociology in the University of Arkansas from 1897, and associate professor of economics in Leland Stanford Junior University from 1902. He has published ‹Tariff History of Canada› (1895).

McLellan, măk-lĕl'ạn, **Isaac,** American poet: b. Portland, Maine, 21 May 1806; d. Greenport, L. I., 20 Aug. 1899. He was graduated at Bowdoin College, practised law for several years in Boston, Mass., and in 1851 removed to New York and gave his whole attention to literature and field sports. His liking for the latter was so strong indeed, and his poems on these themes so numerous, that he gained the title of «the poet-sportsman.» Some of his early poems, such as ‹The Death of Napoleon› and ‹New England's Dead,› attracted much attention. He was the author of ‹The Fall of the Indian› (1830); ‹Mount Auburn› (1843); and ‹Poems of the Rod and Gun› (1886).

McLemore's Cove, Ga., Military Operations at. While there was little fighting in the cove, the operations there in September 1863 were vital to the success of Gen. Rosecrans' campaign for Chattanooga. The failure of Gen. Bragg's excellent combinations immediately increased the difficulty of interposing his army between the Union army and Chattanooga and, in the end, made it impossible.

Lookout Mountain bounds the cove on the west. Following its eastern base from Chattanooga southward, it is 24 miles to Stevens' Gap, over which the Fourteenth corps, Gen. Thomas', which constituted the centre of Rosecrans' army, crossed Lookout from the west into the cove. Eight miles beyond is Dougherty's Gap, from which point Pigeon Mountain, running northeastwardly, forms the eastern boundary of the cove. The triangular area thus enclosed is from five to eight miles wide, the mouth opening toward Chattanooga, and contains from 80 to 100 square miles. Gen. Bragg, in evacuating Chattanooga, because of Rosecrans' flank movement, had conducted his army by way of Rossville and Lee and Gordon's Mill and established it behind Pigeon Mountain, from a point near Lee and Gordon's to Lafayette, 13 miles beyond. From this position of his army there were four gaps through which roads led into McLemore's Cove. Opposite Lafayette was Dug Gap, to the south of it Blue Bird, and to the north Cattlett's and Wrothen's. Dug Gap was directly opposite Stevens' Gap. The Chickamauga Creek rises near Dougherty's Gap and runs northward through the cove.

The right of the Union army, A. McD. McCook's Twentieth corps, with the cavalry corps, Gen. D. S. Stanley, crossed Lookout at Valley Head, 42 miles south of Chattanooga, and descended south of Dougherty's Gap. The left of this army, Crittenden's Twenty-first corps, had crossed the north point of Lookout near Chattanooga and, leaving one brigade in that city, had advanced to the vicinity of Lee and Gordon's Mill. It there formed the left of the Union army. The centre corps was at Stevens' Gap, 15 miles distant, the right corps about 25 miles beyond that point, with the cavalry still farther south. This separation of Rosecrans' army was made necessary by the fact that there were no roads practicable for wheels crossing Lookout Mountain in closer proximity.

Gen. Bragg was fully informed of the movements, and the isolation of the several Union corps. These movements, which placed each corps beyond supporting distance from either of the others, were immediately rendered still more precarious by reports received from Gen. Sheridan on the extreme right that the enemy was retreating toward Rome, which led Gen. Rosecrans to order pursuit. Gen. Thomas urged active concentrations instead, but was overruled.

Gen. Bragg, from his position behind Pigeon Mountain, commanding the four gaps opening directly upon the advance of the centre across the cove, was in most favorable position for first striking Gen. Thomas with effect, and then turning upon either of the wings before they could attain supporting distance. Had Bragg's orders been promptly and vigorously executed the situation of the Union army would have been critical.

The night of the 9th, Negley's division, forming the Union advance from Stevens' Gap along the road leading through Dug Gap to Lafayette, encountered the enemy in the gap, and later in the night it was ascertained that a strong force was concentrating there.

Gen. Bragg, in developing his plan, had advanced Hindman's division from the Lafayette side of the mountain, and ordered Gen. Hill to send Cleburne to co-operate. Late at night Hill sent word that Cleburne was sick, the gaps blocked with felled trees, and that the movement was, therefore, impracticable.

Early the next morning Gen. Buckner from the extreme right was ordered to advance into the cove to support Hindman. This junction was not effected until the afternoon of the 10th. Meantime, Negley had withdrawn his division from Dug Gap and was maneuvering in defense. Hindman, instead of attacking as ordered, sent a staff-officer to Bragg at Lafayette to suggest a change of plan. This officer reached Bragg at midnight and was at once directed to return and notify Hindman to carry out the orders he had received. Cleburne was then in Dug Gap, and had promptly cleared away obstructions. Walker's reserve corps was ordered forward to join Cleburne in the attack, and all impatiently waited for Hindman's guns. Bragg had ordered seven divisions to co-operate in this movement against Thomas' three which composed the Union centre. Hindman did not attack until afternoon. At that time Baird's division had arrived from Stevens' Gap to support Negley, and by brilliant movements in retreat, with some sharp fighting by T. R. Stanley's and Starkweather's brigades, the two divisions with their trains were withdrawn in perfect order to Bailey's crossroads, a strong strategic position in front of Stevens' Gap, where Brannan's division, which had completed the crossing of Lookout, was within easy supporting distance. Thus Bragg's attempt to crush the Union centre failed. For this failure he held Hill and Hindman responsible.

Bragg then withdrew the forces operating against the Union centre to Lafayette, and at once despatched Polk's and Walker's corps with orders to attack Crittenden's corps in the vicinity of Lee and Gordon's Mill. This corps at the time was known to Bragg to be divided, with one of its three divisions near Ringgold. Polk was urged to attack with the greatest promptness. He, however, was led to believe that a general attack on his column was about to be delivered. Instead of carrying out Bragg's orders, he therefore awaited attack and sent for the whole of Buckner's corps as reinforcements. This delay enabled Crittenden to unite his forces, cross the Chickamauga, and take a strong position on the bluffs overlooking that stream at Lee and Gordon's. Thus Bragg's attempt to crush the Union left failed, as his movement on the centre had miscarried. For this Polk was held responsible.

Meantime the Union right was withdrawing under orders to join the centre at Stevens' Gap. Rosecrans had early discovered that Bragg, instead of retreating, was concentrated for battle, and that Johnston from Mississippi and Longstreet from Virginia were about to join him. Gen. Rosecrans in his report says: «It then became a matter of life and death to effect the concentration of the army.» The flanks of the army were 40 miles apart by the nearest practicable roads, and the centre was obliged to remain near Stevens' Gap until the right corps arrived.

Gen. Bragg's third plan, for which orders were promptly given, was to move his army down the valley of the Chickamauga, cross at the bridges and fords below Lee and Gordon's Mill, sweep up the valley, attack Crittenden, the left of Rosecrans' army, drive it back on the centre, and thus, interposing between the Union army and Chattanooga, push it back into the mountains and regain that most important city. Rosecrans, however, by an undiscovered night march moved his centre and right from the cove to the left of Crittenden, and at sunrise of 19 September had interposed between Bragg and Chattanooga on the field of Chickamauga. These movements of the opposing armies brought on the battle of Chickamauga (q.v.).

H. V. Boynton.

McLennan, măk-lĕn'ạn, **John Ferguson,** Scottish sociologist: b. Inverness 14 Oct. 1827; d. Hayes Common, Kent, 16 June 1881. He was educated at King's College, Aberdeen, and Trinity College, Cambridge and after two years' journalism in London returned to Edinburgh, and was called to the bar in 1857. His first important publication was the article on ‘Law’ in the 8th edition of the ‘Encyclopædia Britannica’ (1857), and in 1865 he elaborated some of its speculations in ‘Primitive Marriage: an Inquiry into the Origin of the Form of Capture in Marriage Ceremonies.’ In 1876 his ‘Primitive Marriage’ was republished with ‘Kinship in Ancient Greece’ and other matter under the title of ‘Studies in Ancient History.’ An unfinished work by him, directed against Sir H. S. Maine's patriarchal theory, was completed and published in 1885 by his brother under the title of ‘The Patriarchal Theory.’ In 1896 a second series of ‘Studies in Ancient History,’ treating of the origin of exogamy, was edited by his widow and Arthur Platt. Though his views are still and probably will remain matter of controversy, the study of primitive society received a powerful impetus from his important investigations.

McLeod, măk-lē'ŏd, **Archibald Angus,** American railway official: b. Compton County, Quebec, Canada, 1848; d. 1902. Early in life he came to the United States, where he became a rodman on the docks of the Northern Pacific railway at Duluth, and in 1885 manager of the Elmira, Cortland and Northern line. He then was successively acting general manager (1886), vice-president and general manager (1887), and president (1890) of the Reading system. His consolidation of the Lehigh Valley and Jersey Central with the Reading, under Reading control, for the purpose of controlling the carrying trade of the coal fields, resulted in the Reading passing into the hands of three receivers, of whom McLeod was one.

MacLeod, măc-lowd', **Donald,** Scottish Presbyterian clergyman and author: b. Campsie, Stirlingshire, 18 March 1831. He is a brother of Norman McLeod (q.v.), whom he succeeded as editor of ‘Good Words’ in 1872. He was educated at the University of Glasgow. He held pastorates at Lauder (1858), Linlithgow (1862) and Glasgow (1869), and, like his brother, was chaplain to Queen Victoria. He published ‘Sunday Home Service’ (1885); ‘Christ and Modern Society’ (1893); etc.

Macleod, Fiona, Scottish poet and novelist. She is a native of the Hebrides Islands and spent a large part of her youth there and in the islands of Iona and Arran. Her stories and poems illustrative of Celtic legend and fable have attracted great attention by reason of their freshness of treatment and originality of conception. Among her works are: ‘Pharais’ (1895), a romance; ‘The Mountain Lovers’ (1895); ‘The Sin-Eater and Other Tales’ (1895); ‘The Washer of the Ford’ (1896); ‘Green Fire’ (1896); ‘From the Hills of Dream’ (1896); ‘The Laughter of Peterkin’ (1897); ‘Through the Ivory Gate’ (1901); ‘The Silence of Amor’ (1902).

MacLeod, Norman, Scottish Presbyterian clergyman: b. Campbelltown, Argyleshire, 3 June 1812; d. Glasgow 16 June 1872. Educated at Glasgow, Edinburgh, and in Germany, he became minister first of Loudon and then of Dalkeith, when he published his first work, ‘The Earnest Student,’ and became editor of the ‘Edinburgh Christian Magazine.’ In 1851 he became minister of the Barony parish, Glasgow, where he labored with increasing popularity for the rest of his career. In 1854 he was appointed one of the queen's chaplains for Scotland and dean of the order of the Thistle. He became editor of ‘Good Words’ in 1860 and continued in that post till his death. In 1867 he visited India, and in 1871 published ‘Peeps at the Far East.’ In 1869 he was elected moderator of the General Assembly of the Church of Scotland. Consult D. MacLeod, ‘Memoir of Norman MacLeod’ (1872).

McLeod, Xavier Donald, American writer: b. New York 17 Nov. 1821; d. near Cincinnati, Ohio, 20 July 1865. He was graduated from Columbia and entered the Episcopal ministery in 1845. Becoming a Roman Catholic in 1852 he took priest's orders in that faith later and was professor of rhetoric in Mount Saint Mary's College. He published ‘Pynnshurst’ (1852); ‘Life of Sir Walter Scott’ (1852); ‘The Blood-Stone’ (1853); ‘Lescure’; ‘Life of Mary Queen of Scots’ (1857); etc.

Maclise, Daniel, English painter: b. Cork 2 Feb. 1806; d. Cheyne Walk, Chelsea, 25 April 1870. He became a student at the Royal Academy in 1828, and began to exhibit in 1829, but it was not until 1833 that he established his reputation with his picture of ‘Snap Apple Night.’ Three years after he was elected an associate, and in 1840 he became a full member of the Royal Academy. Maclise was commissioned to paint for the new Houses of Parliament, and produced ‘The Spirit of Chivalry’; ‘The Spirit of Religion,’ and the two great paintings of the ‘Meeting of Wellington and Blücher after Waterloo,’ and the ‘Death of Nelson’ (1858-64), for which patriotic paintings he refused all remuneration. Among his best known pictures are ‘Merry Christmas in the Baron's Hall’; ‘The Ordeal of Touch’; ‘The Marriage of Strongbow and Eva’; the ‘Play Scene in Hamlet’; the ‘Banquet Scene in Macbeth,’ etc. His sketches, book illustrations, humorous drawings, and outline portraits were very numerous. He declined the presidency of the Academy in 1866. His works show great fertility of invention, skill in composition, and excellence in drawing, but his color is coarse, and his pictures are sometimes disagreeable unless seen from a distance. Consult O'Driscoll, ‘Memoir of Daniel Maclise’ (1871).

Maclure, măk-lūr', **William,** American geologist: b. Ayr, Scotland, 1763; d. San Angel, near the city of Mexico, 23 March 1840. In 1796 he visited the United States, and in 1803 was in Europe as one of the commissioners to settle the claims of American citizens against France for spoliations during the revolution in that country. On returning to America he engaged with zeal in the extraordinary private undertaking of a geological survey of the whole country. Depending on his own resources and observations at a time when geology was unknown as a science, and few could appreciate his motives, he visited almost every State and Territory, crossing and recrossing the Alleghanies no fewer than 50 times. His first communication to the public was a memoir entitled ‘Observations on the Geology of the United States, explanatory of a Geological Map,’ read before the American Philosophical Society, 20 Jan. 1809, and published in Vol. VI. of their ‘Transactions.’ He still continued his explorations, and on 16 May 1817, presented another memoir to the society, published in their ‘Transactions,’ and also in a separate volume. The former publication was 6 years prior to that of the geological map of England prepared by William Smith, a production which gave him the title of father of English geology. To Maclure is equally due the title of father of American geology. His publications attracted much attention to the science. He now settled in Philadelphia and gave his books and collections to the Academy of Natural Sciences of which he was president from 1817 till his death. He lived in Spain, 1819-24, where he attempted to found an agricultural college, and returning in 1824 to the United States attempted to carry out a similar scheme in the New Harmony settlement in Indiana. Several distinguished naturalists from Philadelphia joined him in this enterprise, but the scheme failed. After 1828 he lived in Mexico, always, however, with the intention of returning to the United States, and with his interest in the progress of scientific education there unabated. While in Mexico he wrote ‘Opinions on Various Subjects,’ devoted mainly to political economy (1837).

MacMahon, măk-mä'hŏn, **Ella,** English novelist. She has published ‘A New Note’ (1894); ‘A Modern Man’ (1895); ‘A Pitiful Passion’ (1896); ‘The Touchstone of Life’ (1897); ‘An Honorable Estate’ (1898); ‘Fortune's Yellow’ (1900); ‘Such as Have Erred’ (1902).

MacMahon, Marie Edme Patrick Maurice de, Duke of Magenta and Marshal of France: b. Sully, Saône et Loire, 13 June 1808; d. near Montargis 17 Oct. 1893. He was educated at the military college of St. Cyr; served with distinction in Algeria; became brigadier-general in 1848; received command of a division during the Crimean war, and assisted in storming the Malakoff; took part in the campaign of 1859 against Austria, and won the battle of Magenta by his prompt handling of the left wing; and after the war became governor-general of Algeria. At the outbreak of war between France and Germany (1870) MacMahon was placed in command of the First army corps, which was defeated at Weissenburg and Wörth, and finally fell back upon Châlons. Here he rallied his forces, and proceeded northeastward to relieve Bazaine, who was besieged in Metz, but he was pursued by the Germans, shut up by them in the town of Sedan, and wounded in the battle before the final surrender. After the armistice with Germany he was employed by the Versailles government in putting down the commune, and in 1873 was elected president of the republic, a position which he occupied until 1879. Consult Daudet, ‘Le Maréchal de MacMahon’ (1883); LaFarge. ‘Histoire Complète de MacMahon, Maréchal de France, Duc de Magenta’ (1898).

McMas'ter, Guy Humphrey, American poet and jurist: b. Clyde, N. Y., 3 Jan. 1829; d. Bath, Steuben County, N. Y., 13 Sept. 1887. He was educated at Hamilton College, Clinton, N. Y., studied law and became judge of Steuben County in 1864 and surrogate in 1884. At 19 he wrote ‘Carmen Bellicosum,’ better known as ‘The Old Continentals,’ published in the ‘Knickerbocker Magazine’ and still popular. Aside from this, his best-known poems are: ‘A Dream of Thanksgiving Eve’ (1864); ‘The Professor's Guest Chamber’ (1880); ‘The Commanders’ (1887).

McMaster, John Bach, American historian: b. Brooklyn 29 June 1852. He graduated from the College of the City of New York in 1872, studied civil engineering, and 1877 became instructor of civil engineering at Princeton. In 1883 he published the first volume of his 'History of the People of the United States,' and the same year was appointed professor of American history in the University of Pennsylvania. His 'History,' of which five volumes were published in 1900, has become a standard work. It covers a period reaching from the adoption of the Constitution in 1789 to the outbreak of the Civil War,— less than 100 years, but a crucial time for the shaping of the country. The account of the formative time, the day of the pioneer and the settler, engages his particular attention and receives his most careful treatment. He strives to give a picture of social rather than constitutional and political growth; and tells the story of national evolution with admirable lucidity and simplicity of style, and always with an appeal to fact precluding the danger of the subjective writing of history to fit a theory. His other works are: 'Benjamin Franklin as a Man of Letters' (1887); 'With the Fathers, Studies in American History' (1896); 'Origin, Meaning, and Application of the Monroe Doctrine' (1897); 'A School History of the United States' (1897); 'A Primary School History of the United States' (1901); 'Daniel Webster' (1902); 'Brief History of the United States' (1903).

McMaster University, Toronto, Canada, is controlled by the Baptist Convention of Ontario and Quebec. It came into existence through the gift of about $1,000,000 by the late Senator William McMaster, of Toronto, but it is really a development of educational work formerly conducted at Woodstock, Ont. In 1857, under the leadership of the Rev. R. A. Fyfe, D.D., subscribers to the funds of a projected college secured from the Canadian Parliament an act to incorporate «The Canadian Literary Institute,» to be located at Woodstock. This school aimed at co-education and provided both literary and theological courses. In 1875 it secured affiliation with the University of Toronto. In 1881, through the liberality of Mr. McMaster, the Toronto Baptist College was instituted and to it was transferred the theological department of the school at Woodstock. The latter continued its literary work, and, without change of corporation, its name was changed to Woodstock College. Toronto Baptist College was affiliated to the University of Toronto in 1885, but as the result of a further donation by Mr. McMaster it was decided to establish a university to grant degrees in the «several arts, sciences and faculties,» as well as in theology. A charter was secured from the legislature of Ontario in 1887, and all the property and rights of the two separate corporations were vested in McMaster University and placed under the authority of the Board of Governors, 16 in number (exclusive of the Chancellor), responsible to the Baptist Convention of Ontario and Quebec. The control of all that pertains to the courses of study belongs to the University Senate, a body made up of the members of the Board of Governors, a certain number representing the teaching faculties and others chosen by the graduates in arts and theology. The Senate also nominates, subject to the approval of the Governors, the Chancellor and members of the faculties. Woodstock College, now a school for young men alone, and Moulton College, for young women, are academical departments of the University. Noteworthy provisions of the act of incorporation are that McMaster University is «a Christian school of learning,» the Bible must be included in the course of study, every member of the teaching staff in theology must be a member of a regular Baptist church in Canada, and all other teachers members of some «Evangelical Christian Church.» The first class in arts was graduated in 1894. The total number of students for the year 1903-4 in the three schools of the university was 470.

McMaster, William, Canadian senator and philanthropist: b. Tyrone, Ireland, 24 Dec. 1811; d. Toronto, Canada, 22 Sept. 1887. When 22 years of age, he emigrated to Canada, and after several years' experience in a large wholesale firm in Toronto, commenced business on his own account. He was elected a member of the legislative council for the Midland division of Canada in 1862, and held this seat until he was called to the Senate by royal proclamation in 1867. He was prominently identified with many public institutions, notably as president of the Canadian Bank of Commerce, member of the senate of the University of Toronto, chairman of the Canadian board of the Great Western Railway, and became widely known by his liberal donations to educational and religious institutions, especially those of the Baptist denomination, of which sect he was a member. McMaster University, Toronto, is named in his honor.

McMichael, Morton, American journalist, politician, and orator: b. Burlington, N. J., 2 Oct. 1807; d. Philadelphia, Pa., 6 Jan. 1879. After education in the public schools, he studied law at the University of Pennsylvania, and became a member of the Philadelphia bar in 1827. The year previously he became editor of the 'Saturday Evening Post,' and as an active politician served for several years on the aldermanic bench in Philadelphia. From 1831 to 1836 he was editor-in-chief of the 'Saturday Courier,' and later was connected with the 'Saturday News,' the 'Saturday Gazette,' the 'North American,' and 'United States Gazette,' in 1847 consolidating the last two in one journal, of which he was sole proprietor from 1854 until his death. He was mayor of Philadelphia from 1866 to 1869; president of the Park Commission from its organization in 1867 until his death; and in 1873 was appointed a delegate to the fourth constitutional convention of Pennsylvania. His speeches on public occasions were renowned as models of oratory. A bronze statue was erected to his memory in Fairmount Park.

McMichael, William, American soldier and lawyer: b. Philadelphia, Pa., 4 March 1841; d. New York city, 20 April 1893. The third son of Morton McMichael, he graduated at the University of Pennsylvania in 1859, but left his law studies in April 1861, to enlist as a private when President Lincoln issued his first call for troops. He attained rapid promotion to the grade of colonel, and served under Generals Thomas, Rosecrans, and Grant. He resumed his interrupted law studies after the war and in 1865 became a member of the Philadelphia bar. During General Grant's first tenure of the Presidency he was appointed solicitor of internal revenue of the Treasury Department, but resigned the office in 1871 on his appointment as United States assistant attorney-general. In 1877 he was appointed United States district attorney for the east district of Pennsylvania, but resigned shortly after to go into private practice. President Garfield appointed him a member of the United States Board of Indian Commissioners; in 1882 he was a candidate for Congress on the Independent Republican ticket; and later became a member of the bar of New York city. Like his father, he was renowned for his oratorical gifts.

McMicken, Gilbert, Canadian official and inventor; b. in Wigtonshire, Scotland, in 1813; d. Manitoba 6 March 1890. He emigrated to Canada in his 21st year, lived for several years in the Niagara district, and was appointed to various municipal offices. Interested in telegraphy, he patented two inventions in 1847, and spanned the Niagara River with the first electric wire stretched across it. From 1857 to 1861 he was the representative from Welland County in the Canadian Legislative Assembly; and as stipendiary magistrate for Canada West during the Civil War in the United States, received high commendation from Lord Monk for the able discharge of his duties. He was commissioner of police for the Dominion, and was active in the suppression of the Fenian Raid of 1870. He was in charge of the Dominion land-office in Manitoba from its opening until his retirement in 1877, also holding the office of assistant receiver-general and other posts. From 1880–82 he was a Conservative representative for Cartier in the Dominion Parliament.

Macmil'lan, a name for many years prominently identified with English publishing interests. Most important was DANIEL MACMILLAN: b. Upper Corrie, Isle of Arran, 13 Sept. 1813; d. 27 June 1857. He took service with a Cambridge bookseller in 1833, and with Seeley, Fleet Street, London, in 1837. He set up in business in London in 1843, but soon removed to Cambridge, and by 1856 had developed a very prosperous trade. He published Hughes' ‘Tom Brown's School Days’ in 1857; but he was chiefly aided by educational publications and the works of Kingsley and F. D. Maurice. Associated with him from 1843 was his brother, ALEXANDER MACMILLAN, previously a schoolteacher at Nitshill, not far from Paisley. In 1863 he was made publisher to Oxford University, and in the same year removed the business to London. ‘Macmillan's Magazine’ made its appearance in 1859. The firm maintains a branch in New York, and publishes many university and educational works, as well as considerable fiction, by American authors.

MacMillan, Conway, American botanist: b. Hillsdale, Mich., 26 Aug. 1867. He was graduated from the University of Nebraska in 1885 and has been State botanist of Minnesota from 1891. He has published ‘Twenty-two Common Insects of Nebraska’; ‘The Metaspermæ of the Mississippi Valley’; ‘Minnesota Plant Life’; etc.

MacMil'lan, Hugh, Scottish Presbyterian clergyman: b. Aberfeldy, Perthshire, Scotland, 17 Sept. 1833; d. 1903. At the time of his death he was minister of the Free West Church, Greenock, N. B. He has been noted as a brilliant writer and preacher, and among his published works may be mentioned: ‘Bible Teachings in Nature’ (1867); ‘Holidays in High Lands’ (1869); ‘The Ministry of Nature’ (1871); ‘The True Vine’ (1871); ‘The Mystery of Grace’ (1893); ‘The Daisies of Nazareth’ (1894); ‘The Clock of Nature’ (1896); several of which have been translated into German, Norwegian, Swedish, French, Italian, etc.

McMillan, James, American capitalist and Senator: b. Hamilton, Ont., 12 March 1838; d. Manchester, Mass., 1902. He entered business at Detroit, Mich., in 1855, since which he enjoyed a prosperous career as organizer of the Michigan Car Company, and general manufacturer in the railroad business. He was elected to the United States Senate as a Republican in 1889, and re-elected in 1895 and 1901. He was active in many commercial enterprises and was president of the Detroit Iron Furnace Company, which employed more than 3,000 men. He gave the city of Detroit a thoroughly equipped hospital, costing $250,000, and endowed it with $300,000; to the University of Michigan a fine Shakespearean library, and added to the college buildings McMillan Hall. He bestowed substantial benefactions on several other institutions.

McMillan, James William, American soldier: b. Clark County, western Virginia, 1826; d. 10 March 1903. At the time of his death he was a member of the board of review of the Pension Bureau. He was brevetted major-general in March 1865, commanded the 1st and 2d brigades of the Nineteenth army corps, served with Butler in the Gulf campaign, and captured the blockade runner Fox, one of the richest prizes of the Civil War.

Macmillan, John, Scottish Presbyterian clergyman: b. Minnigaff, Kirkcudbrightshire, Scotland, 1670; d. Bothwell, 1753. He played a prominent part in the religious movements of his day, being founder of the Reformed Presbyterian Church, whose adherents are often called Cameronians (q.v.) or Macmillanites.

McMillan, Thomas, American Roman Catholic priest of the Missionary Society of Saint Paul the Apostle: b. Ayr, Scotland, 13 June 1851. He is of Irish descent, and when 3 years old came with his parents to America. In 1874 he entered the Missionary Society of Saint Paul the Apostle. His chief work has been in Sunday schools. In 1886 he instituted a «reading circle» movement, which has extended over all the country. In 1889 he was largely instrumental in bringing together, at New York, a large number of editors, journalists, and authors from different parts of the United States to discuss ways and means of making the press more effective in uplifting humanity. This meeting was known as that for the promotion of the «Apostolate of the Press.» In 1892 he was made chairman of the board of studies of the Catholic Summer School of America, a position which he still holds (1903). In 1897 he was the prime mover in the organization of the «Child Study Congress» held in New York city.

Macmillanites. See Macmillan, John, and Cameronians.

McMillen, Benton, American politician: b. Monroe County, Ky., 11 Sept. 1845. He received an academic education and in 1871 engaged in law practice. In 1874 he was elected to the State legislature of Tennessee, and in 1877 was appointed special judge of the circuit court. He was elected to Congress in 1879, and served until 1899, when he was elected governor of Tennessee, and two years later was re-elected.

McMinnville, mǎk-mǐn'vǐl, Ore., city, county-seat of Yamhill County; on the Yamhill River, and on the Southern Pacific railroad; about 55 miles southwest of Portland. It is situated in an agricultural region, in which hops, wheat, and fruit are raised extensively. The city has considerable trade in agricultural products, live-stock, lumber, wool, and some dairy products. The electric-light plant and the waterworks are owned and operated by the city. Pop. (1900) 1,420.

McMinnville, Tenn., town, county-seat of Warren County; on the Nashville, C. & St. L. railroad; about 80 miles southeast of Nashville. It is in the midst of an agricultural region, and in the vicinity is found excellent building stone. Its manufactures are cotton and woolen goods, flour and lumber, foundry and machine-shop products, furniture, and dairy products. It is the seat of the Cumberland University Training School. Pop. (1900) 1,980.

Macmonnies, mǎk-mŭn'ĭz, **Frederick William,** American sculptor: b. Brooklyn, N. Y., 20 Sept. 1863. In his 17th year he became pupil and assistant to Augustus Saint Gaudens, and going to Europe in 1884 he was admitted to the studio of Falguière, and after two years' instruction there opened a studio of his own. In 1889 his statue of 'Diana' was honorably mentioned in the Salon, and his 'Nathan Hale' in City Hall Park, New York, and 'James S. T. Stranahan' in Prospect Park, Brooklyn, were much admired in the Salon 1891. His 'Bacchante' (Salon 1894) was purchased for the Luxembourg. He has been prolific in the creations of the chisel, and his work is to be seen in Washington Memorial Arch, New York city, the Soldiers' and Sailors' Monument in Indianapolis, in the statues of Prospect Park, Brooklyn, and the Battle Monument at West Point. Since 1900 he has devoted himself more and more to painting, in which he exhibits delicacy, freshness of design, and a brilliant technique.

McMur'rick, James Playfair, American scientist: b. Toronto, Ont., 16 Oct. 1859. He was graduated from the University of Toronto in 1879, and is professor of anatomy in the University of Michigan. He has published: 'Invertebrate Morphology' (1894); 'The Development of the Human Body' (1902).

McMurtrie, mǎk-mėr'trǐ, **William,** American chemist: b. Belvidere, N. J., 10 March 1851. He was graduated from Lafayette College, Easton, Pa., in 1871 as a mining engineer, and was chemist-in-chief of the Department of Agriculture in Washington 1873–8. After serving as the special agent of that department at the Paris Exposition of 1878 he was professor of chemistry in the University of Illinois 1882–6, and chemist to the State board of agriculture 1886–8. In 1884 he received from the French government the title of Chevalier du Mérite Agricole, and in 1897 was elected president of the American Chemical Society. He has published 'Culture of the Sugar Beet' (1879); 'Culture of Sumac' (1879); 'Examination of Wools and Other Animal Fibres' (1887); etc.

McNab, Sir **Alan Napier,** Canadian statesman: b. Niagara, Ont., 19 Feb. 1798; d. 8 Aug. 1862. He entered the navy as midshipman in 1813, but soon abandoned the navy for the army; was present at the capture of Fort Niagara, and commanded the advance guard at the battle of Plattsburg. At the close of the war he studied law, and practised in Hamilton, and in 1829 was elected a member of the assembly for the County of Wentworth, and after serving three terms was returned by the electors of Hamilton. He was subsequently chosen speaker of the lower house. During the insurrection of 1837–8 he commanded the militia on the Niagara frontier, routed the insurgents near Toronto 7 Dec. 1837, and a party of American sympathizers having occupied Navy Island in the Niagara River, whence they were cannonading the village of Chippewa on the Canadian side, he sent a party to seize the steamer Caroline, employed to convey them supplies, and having driven the crew ashore, set fire to it and sent it over the Falls. Although the seizure was made on the American side of the river, the act was approved by the British government, and for his services to the crown during this insurrection McNab was knighted. In 1854 he was prime minister under the Earl of Elgin, retaining office for a few months under his successor, Sir Edmund Head. On retiring from the premiership in 1856 he was made a baronet.

MacNab, Frances. See Fraser, Alice.

McNair, mǎk-nār', **Frederick Vallette,** American naval officer: b. Jenkintown, Pa., 13 Jan. 1839. He was educated at the United States Naval Academy and served in the Minnesota 1857–9. In 1861 he became lieutenant, and during the Civil War took part in the bombardment of Forts Jackson and St. Philip, the capture of New Orleans, and the destruction of the Confederate ram Arkansas. He was instructor at the naval academy 1867–8, in 1872 became commander, and in 1887 was placed in command of the Omaha in the Asiatic squadron. In 1895 he was made admiral, a member of the lighthouse board in 1898, and in July of the last named year was appointed to take charge of Admiral Cervera and other Spanish prisoners of war. Upon their return to Spain he was appointed superintendent of the Naval Academy.

Macomb, mạ-koom' or mạ-kōm', **Alexander,** American general: b. Detroit, Mich., 3 April 1782; d. Washington, D. C., 25 June 1841. He entered the United States army in 1799 as a cornet of cavalry, and at the commencement of the war with Great Britain in 1812 held the rank of lieutenant-colonel of engineers and adjutant-general of the army. In January 1814 he was promoted to be a brigadier-general and placed in command of that part of the northern frontier bordering on Lake Champlain. At Plattsburg, on 11 Sept. 1814, he sustained the attack of a greatly superior British force under Sir George Prevost, which, after the defeat of the British squadron on Lake Champlain on the same day, retreated to Canada. For his firmness and courage on this occasion he was commissioned a major-general, and received the thanks of Congress and a gold medal. In 1835 he succeeded to the office of commander-in-chief of the army, which he held until his death. He wrote a 'Treatise on Martial Law and Courts Martial, as Practised in the United States' (1809).

Macomb, Ill., city, county-seat of McDonough County; on the Chicago, B. & Q. railroad; about 65 miles northwest of Springfield. It is situated in an agricultural region and in the vicinity are extensive deposits of fire-clay. The first permanent settlement was made about 1841, and the place was incorporated in 1857. The chief manufactures are sewer-pipe, stoneware, and pottery. There is considerable trade in farm products, coal, and lumber. The Western Illinois State Normal School is located here, and the free public library contains about 10,000 volumes. The government is administered, under a charter of 1872, by a mayor, who holds office two years, and a council. The city owns and operates the waterworks. Pop. (1890) 4,052; (1900) 5,375.

Macon, mā'kȯn, **Nathaniel**, American statesman: b. Warren County, N. C., 17 Dec. 1757; d. there 29 June 1837. He was educated at Princeton; in 1777 left college and served as a common soldier in the Continental army till the provisional treaty of peace in 1782, refusing any pay or military distinction. When the Constitution of the United States was submitted to the vote of the people of North Carolina, he firmly opposed it, on the ground that it bestowed too much power on the government, and made it in effect independent of the State. He never lost this dislike of the Constitution, and had unlimited confidence in the capacity of the people for self-government; his favorite saying being that "if left alone they would always do what was right." He was a member of the United States House of Representatives 1791–1815, and in 1816 was elected to the Senate, where he served till 1828, when he resigned his seat, having been then a member of Congress for 37 successive years.

Macon, Ga., city and county-seat of Bibb County, near the centre, one of the most important and rapidly growing business and manufacturing centres of the New South; 86 miles by rail from Atlanta, 136 from Augusta, and 197 from Savannah. It lies at the southeastern edge of the Appalachian mountain wall, on both sides of the Ocmulgee River: which pours from the upper plateau with a fall of about 90 feet in seven miles above the city, furnishing immense power soon to be developed by electric works to operate the manufactories. It is bridged here, but is navigable thence to its mouth all the year round, even at low water, for steamers of three feet draft. Macon is the greatest railroad centre in the State except Atlanta, six lines converging there,— the Southern, Central of Georgia, Georgia Southern & Florida, Macon & Birmingham, and Macon, Dublin & Savannah,— making eleven lines radiating from it. By through traffic arrangements it is also a part of the Seaboard Air Line, Atlantic Coast Line, and Louisville & Nashville, parlor and sleeping cars running from Macon to all; 60 passenger trains a day leave the union station.

Macon lies in the midst of a fast developing cotton district, as well as one of fruit and vegetables, making it a great agricultural market; near hardwood and yellow-pine forests, hills of granite, and deposits of brick and fire clays and the finest kaolin for porcelain, all, with the cotton, furnishing raw material for its important manufactures. In more detail it is the fourth inland cotton market of the United States, only Houston, Memphis, and Augusta (Ga.) exceeding it; and handles over 200,000 bales a year, valued at over $6,500,000. It is at the edge of the Georgia peach belt, and sends away over 2,000 car-loads a season; in pears, plums, strawberries, and raspberries, besides grain and garden vegetables, it also does a great shipping as well as domestic business. But it is in manufacturing that its growth is most rapid and significant: with the attendant business accessories and banking facilities there has been a complete revolution in the past half dozen years. In 1900, it had 182 establishments, employing $5,076,005 capital and 3,963 workmen and clerks, paying $1,047,437 in wages, and turning out $6,495,767 in product; in 1903 the last three items must have at least 50 per cent added, and the first be heavily increased. By far the greatest of these was then the cotton manufacture, in which Macon was taking a high place and promising to rival the great Northern seats of the manufacture: in 1900 its product was $1,237,125, and it had increased 25 per cent within the year. Every branch of the industry is represented,— yarn, duck, cordage, twine, hosiery, and knit underwear; and it employed about a fourth of the total city wage-earners. Second only to this at present, if second, is the manufacture of cottonseed-oil for table use and packing, cottonseed meal and cake for provender and fertilizer, compound lard, plantene, and soap from the oil. This is a great and rapidly growing industry throughout the State, the seed netting the farmers half as much as the fibre; and Macon has an enormous plant started in 1896. The railroad shops which the many lines have located here turned out some $500,000 of product. Next to these in volume were lumber and planing-mill products, sash, doors, blinds, and interior finish, with a market in all the States east of the Mississippi; the present output is fully $500,000 a year. The largest vein of kaolin in the country, 30 miles wide and 35 to 70 feet deep, lies within seven miles of Macon; four companies, all established since 1900, are mining this to the extent of probably $250,000 a year, and another has recently been organized. Brick and tile, paving and roofing materials, are all part of the products of the various fine clays. Foundry and machine-shop products, agricultural implements, sewing-machine findings, carriages and wagons, furniture, barrels and firkins (especially for the great oil and lard product), brooms and brushes, saddlery and harness, confectionery (a great specialty, four factories producing some $200,000 worth a year), malt liquors, patent medicines, and artificial ice are a part of the thronging industries. The banking business for 1902 was about $120,000,000 in the gross, and the clearing-house totals over $40,000,000, a greater amount than in several Northern places of much greater population. The money-order business is about $500,000 yearly, an increase of 20 per cent in three years.

The city is on elevated sandy ground, with excellent drainage and sanitary conditions, and a mild even climate. It is a notedly handsome place, with immensely wide streets,— 100 to 180 feet,— beautifully shaded; Vineville, a part of the city, in the rear is covered with costly residences, and furnishes a noble view of the city. Central City Park with fair grounds, fully equipped, was laid out in 1870 at large cost; there are also Tatnall, Daisy, and Chickamauga parks. Rose Hill Cemetery, half a mile down the river, containing 150 acres, is of widely famed beauty. There are very interesting Indian mounds in the vicinity. It has good trolley service; and an excellent water supply from the Ocmulgee River. There are two daily papers and two public libraries; Mercer University (Baptist, 1831), Wesleyan Female College (1836, the first chartered in the country), St. Stanislaus College (Roman Catholic, preparatory for the priesthood), Mt. De Sales Academy (Roman Catholic), Home for Aged Masons, and the State Academy for the Blind (1852), with a library of several thousand volumes. There is a government building, an Academy of Music, and several charitable institutions. It is governed under the charter of 1893, with a two-year mayor and a one-chambered council. Population in 1850, 5,720; 1860, 8,247; 1870, 10,810; 1880, 12,749; 1890, 22,746; 1900, 23,272, of whom 11,561, or about half, were colored. By an act of the General Assembly at its last session, two of the principal suburbs were annexed, making the population 30,000. With other suburbs between which and the city proper is only an imaginary line, the population is 45,000.

Macon was settled about 1822, incorporated as a town in 1823, and received a city charter in 1832. It was named after Nathaniel Macon (q.v.) of North Carolina.

Bridges Smith,
Mayor of Macon.

Macon, Miss., city, county-seat of Noxubee County; on the Noxubee River, and on the Mobile & Ohio railroad; about 108 miles east by north of Jackson. The agricultural lands surrounding the city are almost wholly used for the cultivation of cotton. It has cottonseed-oil mills, cotton gins, and cotton compress. Its trade is chiefly in cotton. Pop. (1900) 2,057.

Macon, Mo., city, county-seat of Macon County; on the Wabash and the Chicago, B. & Q. R.R.'s; about 20 miles north of Moberley. Surrounding the city is a fertile agricultural region, well watered and well wooded; and in the vicinity are coal fields. The industrial establishments are foundries, machine-shops, flour-mills, wagon and carriage factories, brick yards, cigar factories, and works where dishwashing machines, shears, and agricultural implements are made. Some of its public buildings are the court-house, the county insane asylum, public and private school buildings. The city owns and operates the electric-light plant and the waterworks. Pop. (1890) 3,371; (1900) 4,068.

Macoun, mạ-koon', **John,** Canadian botanist: b. Ireland, 1832. He removed to Canada at 18 and from 1868 to 1879 was professor of botany and geology in Albert College, Belleville, Ont. In 1882 he became botanist to the Geological and Natural History Survey of Canada and in 1887 assistant director. He has published ‹Manitoba and the Great Northwest› (1882); ‹The Forests of Canada and their Distribution› (1895).

Macpherson, măk-fĕr'sŏn, Sir **David Lewis,** Canadian statesman: b. Inverness, Scotland, 12 Sept. 1818; d. 16 Aug. 1896. He was educated at the Royal Academy in his native town, removed to Canada in 1835 and after becoming in 1842 a partner in a forwarding firm in Montreal secured in 1851, with others, a charter for a railway from Montreal to Kingston, the beginning of the Grank Trunk railway. In 1872 he became president of the Interoceanic Railway Company. He sat in the Legislative Council of Canada 1864–7, and in the last named year entered the Dominion Senate and was elected its Speaker in 1880. He was minister of the interior 1883–5 and was knighted in 1884.

McPherson, Edward, American journalist: b. Gettysburg, Pa., 31 July 1830; d. there 14 Dec. 1895. In 1848 he was graduated from the University of Pennsylvania, and although he studied law, soon gave it up for journalism. He sat in Congress 1858–66, was clerk of the House of Representatives 1863–73, 1881–3, and 1889–91, in 1876 permanent president of the National Republican Convention, and was chief of the bureau of engraving and printing in Washington 1877–8. He edited the Philadelphia *Press* 1877–80, was for some years the American editor of the ‹Almanach de Gotha,› edited from 1872 a biennial ‹Handbook of Politics,› and edited the ‹New York Tribune Almanac› from 1877 till his death. He was the author of a ‹Political History of the United States during the Great Rebellion› (1865); and ‹The Political History of the United States during Reconstruction› (1870).

Macpherson, James, Scottish author and translator: b. Inverness-shire 1736; d. 1796. He studied at Aberdeen and Edinburgh. Having published ‹Fragments of Ancient Poetry,› translated from the Gaelic or Erse language, a subscription was raised to enable him to collect additional specimens of national poetry. He produced, as the fruit of his researches, ‹Fingal, an Ancient Epic Poem,› translated from the Gaelic (1762, quarto); ‹Temora and other Poems› (1763), professedly translated from originals by Ossian, the son of Fingal, a Gaelic prince of the 3d century, and his contemporaries. The question of the poem's authenticity gave occasion for violent controversy. From the evidence of the contending parties it may be concluded that Macpherson's prose epics were founded on traditional narratives current among the Highlanders; but the date of the oldest of their lays is comparatively modern, and it is now impossible to ascertain the precise extent of his obligations to Gaelic bards. He had a life allowance from the government, and was agent to the Nabob of Arcot, having also a seat in the House of Commons 1780–90. He was also the author of a very inadequate prose translation of Homer's ‹Iliad› and of some other works.

McPherson, James Birdseye, American soldier: b. Sandusky, Ohio, 14 Nov. 1828; d. Atlanta, Ga., 22 July 1864. He was graduated from West Point in 1853. Appointed brevet 2d lieutenant of engineers, he was assistant instructor of practical engineering at West Point, 853-4, and after serving on fortification and onstruction duty, 1854-61, applied for active mployment in the field at the opening of the ivil War. In May 1862 he was appointed brigdier-general of volunteers and was with Haleck at the siege of Corinth. For his services n this occasion he was made major-general of olunteers in the following November. He ook an important part in the siege and capture f Vicksburg and was in consequence promoted o brigadier-general in the regular army 1 Aug. 863. In March 1864 he was made commander f the department and army of the Tennessee nd performed distinguished services in the ampaign of Georgia. In the following July he ommanded in the engagements around Atlanta nd was killed during a reconnoissance.

McPherson, Kan., city, county-seat of IcPherson County; on the Union P., the Athison, T. & S. F., the Missouri P., and the Chiago, R. I. & P. R.R.'s; about 150 miles west by outh of Topeka. The city is the trade centre f an extensive agricultural region in which he chief products are wheat and corn. It has lour-mills, creameries, grain-elevators, brick and umber yards. Its trade is chiefly in farm and lairy products and in live-stock. Its principal uildings are a court-house, high school, and pera house. It is the seat of the McPherson ollege, under the auspices of the German Bapists. Pop. (1890) 3,172; (1900) 2,996.

McQuaid, Bernard John, American Roman atholic prelate: b. New York city 15 Dec. 823. He pursued part of his studies in Canada, ut completed his classical course at Saint John's ollege, Fordham, N. Y., where he was graduted in 1843, and for the next three years held he position of tutor. He studied theology first vith the Lazarists of New York city and later t Saint John's College, Fordham, being orlained priest January, 1848. Having built hurches at Morristown and Springfield, N. J., e was engaged upon one at Mendham when ummoned to the newly created diocese of Newrk, N. J., 1853. In 1856 Father McQuaid ounded Seton Hall College at Madison, N. J., nd was its first president, retaining the office or ten years, and its subsequent success has een eminently due to his indefatigable efforts. Ie was consecrated first bishop of the diocese f Rochester, N. Y., by Archbishop McCloskey n New York city 12 July 1868. With characterstic energy he has discharged his episcopal duies, the cause of Catholic education ever apealing to him as one of paramount importance. Vith a view to advancing it he invited the Sisers of Saint Joseph to conduct new parochial chools in his diocese and likewise founded aint Andrew's Preparatory Seminary. The paochial schools of his diocese have a larger ttendance in proportion to the Catholic population than that of any other diocese in the Jnited States. He is spiritual adviser of he Ladies' Catholic Benevolent Legion. His iocese now (1905) comprises a Catholic popuation of 110,000; 142 priests; 122 churches; 1 heological seminary; 1 preparatory seminary; 45 arochial schools; 4 orphanages; 2 hospitals, etc.

MacQueary, ma̤-kwē'rĭ, **Thomas Howard,** merican educator: b. Charlottesville, Va., 27 Iay 1861. He was graduated from the Episopal Theological School at Alexandria, Va., in 1886, took orders in the Episcopal Church and in 1882 became rector at Canton, Ohio. His religious views having undergone a radical change he was tried by an ecclesiastical council for denial of miracles and suspended from the ministry for six months. He accordingly resigned from it in September 1891, and was for some time in the Universalist ministry. He founded Unity House Social Settlement in Minneapolis, and since 1900 has been superintendent of the Parental School in Chicago. He is the author of 'The Evolution of Man and Christianity' (1889), the immediate cause of the accusation of heresy which was brought against him, and 'Topics of the Times' (1890).

Macquoid', **Katherine Sarah Thomas,** English novelist: b. Kentish Town, London, [illegible] Jan. 1824. She was married to T. R. Macquoid, a water-color artist, in 1851. Besides many pleasing volumes of travel, such as 'Through Normandy' (1874); 'Through Brittany' (1877); 'In the Ardennes' (1881); 'About Yorkshire' (1883); 'In the Volcanic Eifel,' with her son, Gilbert Macquoid (1896), she has written a long series of novels, not a few of which have been widely read in the United States. Among these may be cited: 'Patty' (1871); 'In the Sweet Spring Time' (1880); 'Little Fifine' (1881); 'At the Red Glove' (1885), by some critics considered her best work; 'The Haunted Fountain' (1890); 'His Last Card' (1895). Her volumes of travel are illustrated by her husband.

Macrauchenia, măk-râ-kē'nĭ-a̤, a genus of fossil South American herbivorous animals, forming a connecting link between the palæotherium and the camel family; in form they nearly resemble the llama, but were as large as a hippopotamus. Their remains have been gathered nearly completely from the Pampas formation of Argentina and Bolivia.

Macready, ma̤-krē'dĭ, **William Charles,** English tragedian: b. London 3 March 1793; d. Cheltenham 27 April 1873. He received his education at Rugby, and originally had the intention of adopting one of the learned professions. The change in his career was brought about by his father, a theatrical manager, having fallen into embarrassed circumstances, to relieve which he joined his father's troupe, then acting at Birmingham. He appeared there for the first time in 1810 in the character of Romeo, in which he was successful. On 16 Sept. 1816 he made his first appearance on the London boards, acting Orestes in 'The Distressed Mother,' at Covent Garden Theatre. He did not achieve an immediate triumph in London, but gradually rose in popular favor. His Virginius was the first of his London successes. From the time when he appeared in this part he continued steadily to improve as an actor, and his successes were no longer confined to the lower walks of the profession. In 1842 he became a theatre manager at Drury Lane, but met with no success, so that he resigned at the end of the second season. His managership at Drury Lane had brought upon him considerable loss, to repair which he visited America (1849). On his return to London he gave some farewell performances, and then retired from the stage in 1851.

Macrobius, ma̤-krō'bĭ-ŭs, **Ambrosius Aurelius Theodosius,** Latin author of the 5th century A.D. The country of his birth is uncertain, but it is inferred from the fact that he speaks of Latin as a foreign tongue to him, that he was probably a Greek. He was the author of a miscellaneous work entitled ‘Saturnalia,’ curious for its criticisms, and valuable for the light it throws upon the manners and customs of antiquity; a commentary on Cicero's ‘Somnium Scipionis,’ in two books, valuable for the exposition it affords of the doctrines of Pythagoras with respect to the harmony of the spheres; and a treatise, ‘De Differentiis et Societatibus Græci Latinique Verbi.’ Consult Von Jan, ‘Macrobius’; and Eyssenhardt, ‘Macrobi Opera.’

Mac'rocosm. See Microcosm.

Macrothe'rium, a genus of extinct ungulate mammals, in some cases of gigantic size, found most completely in the Miocene deposits of Europe, but also known from China and western North America. It represents the primitive group *Ancylopoda,* which had a wide geographical range in the Miocene and Pliocene epochs when it became extinct. The structure of the curiously twisted feet so much resembles that of the ground-sloths that for a long time the macrotheres, as well as their companion, but more generalized genus *Homalodontotherium,* were regarded as edentates. Consult Woodward, ‘Vertebrate Palæontology’ (1898).

Macru'ra. See Decapoda.

MacVeagh, măk-vā', **Wayne,** American lawyer and diplomat: b. Phœnixville, Pa., 19 April 1833. He was graduated from Yale in 1853 and after studying law was admitted to the bar in 1856. He was district attorney of Chester County 1859–64, became prominent as a Republican leader, and conspicuous in his profession, and in 1870–1 was minister to Turkey. He was an active opponent of «machine politics» and in 1872 led the Republican opposition to Simon Cameron, his father-in-law. He was chairman of the «MacVeagh Commission» sent by President Hayes to Louisiana in 1877 to act as the President's unofficial representative and aid in adjusting political differences there. He was attorney-general of the United States, March to September 1881, and was ambassador to Italy 1893–7.

McVickar, măk-vĭk'ar, **William Neilson,** American Protestant Episcopal bishop: b. New York 19 Oct. 1843. He was graduated at Columbia College (1865); and at the General Theological Seminary (1868). He was ordained deacon (1867) and priest (1868). Being elected coadjutor bishop of Rhode Island, 19 Oct. 1897, he was consecrated 27 Jan. 1898, and on the death of Bishop Thomas March Clark, September 1903, succeeded to the see.

Ma'cy, Jesse, American historian: b. Henry County, Ind., 21 June 1842. He was graduated from Iowa College in 1873, and has been a member of the faculty there since that date, becoming professor of constitutional history and political science in 1885. He has written ‘Civil Government in Iowa’ (1881); ‘Institutional Beginnings in a Western State’ (1883); ‘Our Government’ (1886); ‘A Government Text-Book for Iowa Schools’ (1887); ‘The English Constitution’ (1897); ‘Political Parties in the United States, 1846–1861’ (1900); and numerous magazine articles.

Mad Anthony, a nickname given to the Revolutionary general Anthony Wayne (q.v.) on account of the seeming recklessness of his brilliant military feats.

Mad Apple, the fruit of an American nightshade, especially that called Sodom apple (*Solanum sodomiæ*), the eating of which produces poisonous intoxication.

Mad Mul'lah, term applied to Mohammed Ali, the Mahdi, or Moslem Messiah: b. Somaliland 1843; d. 1884. In his youth Mohammed was initiated into the mysteries of the occult sciences and sorcery. These he learned among the tribe of the Danakil, which has always been renowned for its magicians. A study of the Koran and the Arab writings followed in the Marabout school. When quite young the future Mullah was taken with the idea of making the pilgrimage to Mecca, and not content with one journey made the sacred visit three or four times. His object was to obtain a greater reputation for holiness than that held by the other pilgrims.

After his last pilgrimage Mohammed returned to Berbera, but met with small success in that commercial town. Seeing no prospect before him but that of remaining a poor, begging pilgrim, he determined to strike out a new line for himself, and established himself among a powerful inland tribe. Here he made his position secure by his appearance of holiness, his impressive airs, and the assurance with which he made his prophecies. At this time and hereafter the magic learnt in his boyhood stood him in good stead whenever his holiness was not able to overawe his somewhat turbulent followers. He assumed the title of Mullah (priest and heaven-sent), and even that of Mahdi (prophet). Overwhelmed with presents by his credulous followers, he was soon among the richest of the land, and with his riches his influence grew apace.

His pride waxed very great, and one day he ordered all the Korans of the ordinary priests to be burned, saying that he himself was the living Koran, and that he was to be obeyed as a new prophet sent from Allah. Not content with persuasion, the Mullah, following the example set by Mohammed the Great, threatened with death all those who disbelieved, and in following up these threats caused the disturbances which brought about the Somaliland campaign. Possessing the power of calling forth the enthusiastic support of the tribesmen, the Mullah has not had to rely upon himself alone for the conduct of his campaigns. If report speak truly, besides the Austrian, Karl Inger, he had as lieutenant an English naval officer. In 1881 he destroyed the Egyptian army despatched against him. He died of smallpox. See Egypt, Sudan.

Consult Darmesteter, ‘The Mahdi’ (1885); Hoffmann, ‘Mahdithum’ (1899); E. Müller, ‘Beiträge zur Mahdilehre des Islams’ (1901).

Madach, mŏ'däch, **Emerich,** Hungarian poet: b. Also-Sztregova 21 Jan. 1823; d. there 5 Oct. 1864. He studied law, was a notary in his native country, and was also active as an orator and journalist. He wrote on archæology and æsthetics; and both lyric and dramatic verse. His principal works are the two dramatic poems, ‘Moses’ (1860); and ‘The Tragedy of Man’

(1860). The latter owes much to 'Paradise Lost,' and to 'Faust,' but is yet a remarkable performance. Though strongly contemplative in character, it was successfully presented to Austria and Hungary in 1830. There is an excellent rendering in German by von der Lech (1888). Consult: Fischer in 'Auf der Höhe,' Vol. XVI. (1885).

Madagascar, măd-a-găs'kar, an island in the Indian Ocean, since 1896 a French colony. It is separated by the Mozambique Channel from the southeast coast of Africa, the nearest point being 230 miles distant. It is 975 miles long from Cape St. Mary in the south to Cape Amber in the north, has an average breadth of 250 miles, and an estimated area of 227,750 square miles, being after Greenland, New Guinea, and Borneo, the fourth largest island in the world.

Topography.—Madagascar consists of an elevated region with an average height of from 3,000 to 5,000 feet overlooked by mountains rising in some cases to nearly 9,000 feet above the sea-level. This plateau occupies a much larger proportion of the surface in the north and east than in the west and south, and the greater portion of the island south of lat. 23° S. belongs to a much lower region which does not consist entirely of plains, but is interrupted toward the west by three prominent chains of hills stretching from north to south, one of them apparently in a continuous line about 600 miles in length. The coast exhibits a number of indentations, mostly small, but few good harbors, being in great part rock, though in some places low and sandy.

Hydrography.—The rivers are numerous; few of them offer the advantages of internal navigation. The chief rivers have their courses on the west and northwest sides of the island. The Betsibóka with its affluent the Ikiopa, unitedly measuring 300 miles, may be ascended by light steamers for 100 miles; the Tsiribihina has a somewhat shorter course, but drains by its numerous tributaries a much larger area. The eastern rivers descend from the high land through magnificent gorges, forming a succession of rapids and cascades, the falls in some instances having a descent of 500 feet. There are few lakes of any size as yet known to explorers; one of the largest is Alàotra Lake, measuring 25 miles long; the others do not reach a length of 10 miles. A long chain of lagoons having very short distances between each and often expanding into wide sheets of water stretches for nearly 300 miles along the east coast.

Geology.—Geologically the elevated region consists almost entirely of granite and other igneous rocks, while the lower region is composed chiefly of secondary formations. The former region is traversed by a line of extinct volcanic craters, some of which show signs of comparatively recent activity. Among the more remarkable fossils are remains of a huge struthious bird, the Epiornis, whose egg, measuring 12 by 9 inches, is larger than that of any other known bird. The minerals include iron in abundance, gold, lead, and copper, all more or less worked, while in the northwest coal is found.

Climate.—The climate is various; the heat on the coast is often very intense, but on the high lands of the interior the temperature is more moderate. On the coast the rains are nearly constant, beginning in the evening and sometimes lasting all night; in the interior the winter is dry and agreeable. The greatest amount of rainfall takes place on the east coast, and especially on the northeast, the part directly exposed to the summer monsoon. The elevated region of the interior and the districts on the west coast are tolerably healthy for Europeans, but owing to the large extent of marsh and lagoon on the east, malarial fever prevails, and is frequently fatal to natives from the interior as well as to Europeans. Snow is never found on even the loftiest mountains.

Ethnology.—The inhabitants, known by the name of Malagasy, belong to the Malayo-Polynesian stock and speak a Malayan language. They appear to form substantially a single race, though they have received a considerable intermixture of African blood and a certain amount of Arab intermixture. They are divided into numerous tribes, each having a distinctive name and customs. The Hovas are the predominant tribe; their proper country is the elevated region of the interior, but they extended their sway over nearly the whole island. Among the other chief tribes are the Betsimasaraka on the east coast, the Betsileo in the south central region, and the Sakalava on the west and north. The people are socially divided into three classes: Adrians or nobles, Hovas (in a special and restricted use of the word) or free commoners, and Andevos or slaves. This last section consists, or till recently consisted, partly of debtors and criminals and their descendants, partly of Africans brought over in slave-dhows, and partly of the descendants of other tribes conquered by the Hovas. The Africans were, however, formally set free in 1877. In the coast districts the houses of the better class are built of framed timber with lofty roofs covered with shingles or tiles; the dwellings of the lower classes are constructed of bamboo or rushes, or even of clay. In former and more unsettled times the villages were almost always built on the tops of hills, but during the 19th century this precaution has not been deemed so indispensable.

Flora.—The most striking feature in the vegetation is a belt of dense forest with an average breadth of 15 to 20 miles passing round the whole island, and broken only by a gap in the northwest, where the two ends of the forest overlap. It is found at all levels from 6,000 feet to the water's edge, which it touches on the northeast, where it reaches its greatest breadth of 40 miles. The trees of this forest include many species of lofty palms, hardwooded exogens supplying a great variety of beautifully veined and durable timber, and a large number of trees remarkable for the splendid character of their blossoms. Of all the trees of Madagascar the most striking is the ravinala or traveler's-tree (*Urania speciosa*); it resembles a palm, its stem being crowned by a semicircle of oblong leaves spread out vertically in a fan shape. It owes its name to the fact that the traveler may supply himself with water from it by piercing or breaking the lower ends of the leaf-stalks.

Fauna.—Madagascar has a singularly local fauna which, although upon the whole related to Africa, is so peculiar to itself that with a few neighboring islets, it forms a very distinct subprovince of the African region. Its characteristics show plainly that the separation of the island from the continent occurred at a very ancient time. Another singular feature is the presence of various forms of animal life represented elsewhere only in Oriental Australian regions, with a marked resemblance in a few animals, for example the boas, to South America. From this it is plausibly argued that in early Tertiary times there was a land connection between Madagascar and India and the region thence to Australia, now presented only by the islands of the Malayan Archipelago. (See LEMURIA.) In its mammals Madagascar is singular in what it lacks, as well as in its possessions. It has none of the cattle, equine animals, elephants, rhinoceroses, hogs or even rodents of Africa, except a mouse or two; no lion or true cat or dog of any kind; and no monkeys. On the other hand is has several small insectivora, closely allied to tropical American species; the great majority of all the lemurs, the few outsiders being in Africa and the Orient; and several viverrine quadrupeds, which there take the place of the predatory cats. The modern birds are less striking in their peculiarities, but in the zoological era immediately preceding the present the island possessed those huge ratite birds, the epiornis and its relatives, which gave rise to the story of the roc. Many forms of huge land tortoises were also members of this singular fauna. The fishes, amphibians, reptiles, and lower forms are largely peculiar.

Crocodiles are numerous in the rivers and lakes, and many species of lizards, chameleons, and tree-frogs abound in the forests. Among the insects are numerous brilliantly colored beetles, butterflies, moths, flies, locusts, and spiders, venomous species of the latter as well as scorpions and centipedes being present. See ZOOGEOGRAPHY.

Agriculture. — Of the vegetable products grown for food by far the most important is rice, the staple food of the inhabitants; next in importance come manioc or cassava, sweet-potatoes, beans, tomatoes, ground-nuts, and yams. Ginger, pepper, and indigo grow wild in the woods; cotton, sugarcane, coffee, tobacco, and hemp are cultivated. Humped cattle are found in immense herds, and form a large part of the wealth of the inhabitants; they appear to have been introduced from Africa at a remote period, as the fat-tailed sheep, goats, swine, and horses have been more recently. Under French administration agriculture and cattle-raising are undergoing considerable extension. General Gallieni, the military governor, foreseeing that, for want of French colonists, Madagascar was likely to become a burden on the hands of France, devised a plan in 1899 to hasten the settlement of the country, the efficiency of which has since been proved by practical tests. The country not being thoroughly pacified, a large army of occupation is garrisoned there. Upon the expiration of their terms of enlistment these men are offered large land grants and an annual subsidy from the French government of 2,250 francs ($434) for two consecutive years. In return for these privileges these settlers pledge themselves to reside three consecutive years on the territory allotted to them. During this period they are to cultivate the soil to the best of their ability. They are furthermore obliged to hold themselves in readiness to aid in the defense of the settlements against hostile natives. This experiment was begun with 36 men honorably discharged from the army, their concessions aggregating 8,000 acres, and two years later the issue of the official report of the transactions of the colonial office showed that the plan was successful. Under the intelligent guidance of agricultural experts the country was planted with the staples for cultivation to which it was best adapted, and many of the successful farmers after the first year sent to France for their relatives.

Commerce and Industries. — Rice, cattle, hides, gum, india-rubber, wax, cotton, sugar, vanilla, lard, coffee, gold, gum-copal, and dye-woods are exported. The chief imports are cotton goods, wines and spirits, metals, rice, and flour. In 1901 the total value of imports was $9,206,552, of exports $1,995,095; the value of the gold exported being $660,000. In general the Malagasy show much aptitude for the manual arts. As silversmiths, gunsmiths, and carpenters, they rapidly acquire the skill of Europeans; and with hand-looms of the rudest construction the only ones as yet in use, they make excellent and handsome cloths. The principal article of native dress with both sexes is the *lamba,* a piece of cloth about three yards long and two broad, which is folded round the body above the arms, one end being thrown over the shoulder.

The island is being rapidly opened up by the building of highways, a carriage road, and a railroad having been completed between Tamatave, the chief port and capital, and Antananarivo (q.v.), the ancient capital.

Government. — Prior to 1895 the government was a native absolute monarchy. A French Resident, however, with a military escort, resided at the court and controlled foreign relations, so that the country was virtually a French protectorate. Much friction prevailed in 1893-4, between the government and the French authorities, and finally France decided to make her protectorate of the island effective. An expedition easily overcame the resistance of the Hova troops, and after some changes in the formation of the administration the island was made a French colony, and General Gallieni was appointed resident-general and commander-in-chief in September 1896. His vigorous and determined policy made a great improvement in the condition of the country. He is assisted by an administrative council, and natives are largely employed in the civil and military administration. An educational system provides primary schools for boys and girls, four normal schools, a school of practical agriculture, two regional schools for agriculture and industries, and a school of medicine. Numerous Catholic and Protestant mission schools have long been established in the island. The religion of the great bulk of the people is a kind of fetishism or worship of charms. Many of their superstitious customs have been abolished and Christianity adopted, chiefly by the Hovas, the Catholic cult prevailing. A court of appeal and tribunals throughout the provinces provide for native justice, while there are special courts for the administration of French justice. The local revenue is derived chiefly from direct taxation, from customs and other indirect taxes, from colonial lands, posts and telegraphs, markets, etc., and from subventions granted by France. The chief branches of expenditure are general administration, public works, post-office, and public debt, the latter being a large item.

Population.— According to the census of 1901, the population amounted to 2,505,237, of whom 2,488,689 were natives, 15,524 European, 1,006 Asiatic and African; the Hovas, the chief native tribe, numbered 850,000.

History.— Madagascar was known to the traveler Marco Polo at the end of the 13th century and had been visited for several centuries by the Arabs. In 1506 it was visited by the Portuguese, who gave it the name of St. Lorenzo. Toward the end of the 17th and during the most of the 18th century the French endeavored to form military stations on the east coast, but with no lasting results. A settlement was established at Fort Dauphin in the southeast and held for some time, but in consequence of the tyrannical behavior of the French settlers they were massacred by the natives and the place destroyed. The French, however, struggled hard and successfully to retain the islands of Ste. Marie on the east coast and Nossi-bé on the northwest. Previous to 1810 Madagascar might be said to have been divided among numerous petty chiefs, almost constantly at war with each other. In that year, however, Radama I., a prince of remarkable intelligence, became king of the Hovas, and began to enforce a claim by right of conquest to the sovereignty of the whole island. He saw that if his people were to be prosperous they must first be educated and civilized. In return for the promise of co-operation in putting down the slave-trade on the coast of Mozambique, he received arms and other assistance from the British, by which he was enabled to carry on his conquests. Christian missionaries began to teach in the capital in 1820, many converts were made, the Bible was translated into the Malagasy tongue, the language was first reduced to a systematic written form, and printing was introduced. Great improvements had taken place in the manners of the people when Radama died in 1828, and was succeeded by his chief wife, Ranavalona, a woman of cruel disposition, and opposed to all innovation. The native converts were persecuted, many of them being put to death, and the island was closed to Europeans. This reign of terror ended at last in 1861, when the queen died, and was succeeded by her son Radama II., who, himself a Christian, reopened the island to European missionaries and traders, and proclaimed the emancipation of the African slaves. He appears, however, to have been a weak prince easily swayed by native and foreign favorites, and he unwisely granted extensive territories and privileges to an enterprising French company, an act which lost him the affection of his nobles, and led to his assassination in 1863. His wife Rasoherina was placed on the throne, and the government repudiated the concessions made to the French, offering 1,000,000 francs as compensation. After a quiet and prosperous reign of five years this queen died, and was succeeded by Ranavalona II. in 1868. After she had been elected queen she and a great number of her courtiers became Christians, and many reforms favorable to enlightenment and humanity were perseveringly carried out. She was succeeded in 1882 by Ranavalona III., when the French brought forward their claims on the Malagasy territory, which being refused, led to hostilities in 1883–5. This war was terminated by a treaty, under which France acquired protectorate rights over Madagascar; but hostile feeling toward the French again led to war in 1895, with the result that the queen was deposed and exiled first to the island of Réunion, and thence in 1899 to Algiers, while Madagascar became a French colony.

Consult: Dawson, ‘Madagascar: its Capabilities and Resources’ (1895); Keller, ‘Madagascar, Mauritius and Other East African Islands’ (1900).

Madame Bovary, mă-dăm bō-vă-rē, a novel by Gustave Flaubert, which appeared in 1856, when the author was 35. It was his first novel, and is regarded as the book which founded the realistic school in modern French fiction— the school of Zola and Maupassant. The novel is a powerful, unpleasant study of the steps by which a married woman descends to sin bankruptcy, and suicide. The time is the first half of the 19th century; the action takes place in provincial French towns.

Mad'den, Frederick William, English librarian: b. London 7 April 1839. He is a son of Sir Frederick Madden, a noted antiquary, and was chief librarian of the Brighton Public Library, 1888–1902. He is a member of various numismatic societies, and among other works has published ‘Handbook of Roman Numismatics’ (1861); ‘History of Jewish Coinage and Money in the Old and New Testaments’ (1864); ‘The Coins of the Jews’ (1881).

Mad'der, (1) in botany, the English name of the plants of the genus *Rubia,* especially *R. tinctorum.* It is a trailing or climbing annual, supporting itself by its leaves and prickles. It is supplied chiefly from Holland, France, Italy, and Turkey. The roots, which are ready the third year, are kiln-dried, and then threshed. They are then dried a second time, and afterward pounded and stamped in a mill. Indian madder, called also madder of Bengal, is *R. cordifolia;* madder of Chile *R. augustissima* or *Relboum.* (2) In chemistry, the root of *R. tinctorum* is extensively used in dyeing for the production of a variety of colors, namely, red, pink, purple, black, and chocolate. Other species of *Rubia* are also used. It would appear that madder contains a colorific principle — rubian — which, under the influence of a peculiar ferment, termed erythrozym, breaks up into alizarin, purpurin, etc. The colors produced from madder are very stable, the well-known Turkey-red being one of them. Madder also contains certain yellow coloring matters, but they are useless, if not injurious, in the process of dyeing. (See DYES; DYEING.) (3) In pharmacy, madder is a tonic, a diuretic, and an emmenagogue. Brown madder, a rich red-brown pigment, prepared from the roots of *R. tinctorum.*

Mad'dox, Richard Leach, English physician and chemist: b. Bath, England, 4 Aug. 1816; d. Portswood, Southampton, 11 May 1902. He studied medicine at University College, London, but was graduated M. D. at Edinburgh. In early life he settled and practised his profession in Constantinople, and here first took up the study of photography. He subsequently left the Bosphorus for Smyrna and was a civil surgeon in the military hospitals at Scutari during the Crimean war, and finally settled at Woolston, near Southampton, England. It was during his residence at Woolston, which lasted until took his B. A. degree in 1771. He remained at Princeton for another year doing special work in Hebrew under Dr. Witherspoon, the president. After his return home he tutored his younger brothers and began a systematic course of reading in theology, philosophy, and law. At this time his study of Hebrew and theology seem to indicate a desire to enter the ministry, but he soon abandoned this and prepared himself for the legal profession and for public service. His theological studies bore good fruit later as is evidenced by the stand he took for religious liberty.

Madison was by instinct a politician and not a soldier; he took no active part in the Revolutionary War, but as early as 1774 he was appointed a member of the Committee of Public Safety for Orange County, and in 1776 was elected delegate to the convention which framed the constitution of Virginia. From that time until he retired from the Presidency he was honored with high public offices by his State and by the nation. In the Virginia Convention Madison succeeded in substituting for a clause in the Bill of Rights permitting the «fullest toleration» in religion, a clause allowing the «free exercise of religion.» This was a distinct blow to religious intolerance for, as he said, toleration implies jurisdiction, and the State should have no coercive power over religious thought. He was a member of the first Virginia Assembly but failed of re-election because, as his biographer Rives tells us, he refused to conform to the universal custom of his day and «treat» his constituents; he was, however, made a member of the governor's council and so distinguished himself that in 1780 while still under thirty he was chosen as delegate to the Continental Congress. In this Congress he was conspicuous for his opposition to the issuance of paper money by the States; for his efforts to secure for Congress the right of taxing imports, and for his determined stand to retain for the States the right of navigation on the Mississippi. Madison saw clearly that a government so organically weak that it could not enforce its requisitions and could pay its debts only by increasing its debt could never be effective; hence he labored unceasingly to enlarge the power of the central government. The office of delegate was limited to one term, so Madison was not returned to Congress in 1784, but the high esteem in which he was held was shown by his immediate election to the State Assembly. Virginia was a very influential State and her attitude toward national questions was of great importance. In the Assembly Madison tried to indoctrinate the people of Virginia with his ideas concerning the Federal power. His bill to regulate trade in Virginia and to provide ports of entry led first to the conference between Virginia and Maryland with reference to trade on the Potomac and later to the Annapolis Convention which met in 1786 to consider the trade and commerce of the United States. This Convention at Annapolis urged upon the States the appointment of commissioners to meet in convention at Philadelphia «to devise such further government as shall appear to them necessary to render the Constitution of the Federal Government adequate to the exigencies of the Union.» The summoning of the Philadelphia Convention was largely due to the wise bills introduced by Madison in the Virginia Assembly and to his direction of public sentiment, and it was eminently fitting that he should be one of the delegates of the Virginia Commission at whose head was George Washington. Madison's views on government are clearly defined in his «outline system» which formed the basis of the Virginia plan proposed to the Convention. His system demanded that there should be a due supremacy of national authority without the exclusion of local authority, that the national authority should extend to the judiciary and to the militia; that the national legislature should be composed of two bodies, the larger elected for a short, the smaller for a longer term; that Congress should have certain coercive powers; that a national executive should be provided and that the basis of representation in Congress should be changed from States to population. The «Virginia plan» was the germ of the Constitution and Madison is rightly called the «Father of the Constitution.» His arguments in favor of the proposed government were exhaustive and convincing, and his private notes of the work of the convention and of his debates purchased from his widow and published by Congress form a valuable addition to our knowledge of this stormy period. While the Constitution was before the people for consideration Madison, Hamilton and Jay wrote a series of papers called in collected form 'The Federalist,' in which they discussed government in general, defined the character of the proposed union, met objections, and proved the advantages to be derived from effective central government. Madison was a member of the Virginia Convention which met to consider the ratification of the Constitution and by his keen analysis and clear cut argument contributed more than any other man to secure its adoption. His chief opponent was Patrick Henry; his ablest ally, John Marshall. Owing to Henry's antagonism, Madison was defeated as candidate for the Senate, but was elected as representative to Congress and took his seat in April 1789. During this session of Congress Hamilton and Madison, who had hitherto been at one in their efforts to centralize power, drifted apart, and Madison gradually began to endorse Jefferson's position as to certain inalienable States rights. There is no reason to accuse him of bad faith; his statesmanship was never overbold, and Hamilton's commercial system, his extensive financial schemes, especially the funding of the national debt and the assumption of State debts by the general government, gave so much power to Congress that Madison withdrew his support from the Secretary of the Treasury and vigorously opposed his measures. Although Madison had now definitely cast in his fortunes with the republican opposition his moderation and good sense enabled him to retain the friendship of most of his political opponents.

From 1793 to 1796 the country was greatly agitated over the relation of the United States toward France, and on the outbreak of war between France and England the President issued a neutrality proclamation to the great disgust of the French, who had expected active friendship from the United States. Although both countries interfered shamefully with American commerce, popular sentiment and the Republican party sided with France. In 1794 Madison, supported by Jefferson, introduced a bill demanding retaliatory measures against Great Britain, and a temporary embargo was laid on British commerce. The signing of the Jay treaty by the President was a signal for an outburst of popu-

lar indignation, and Madison, as leader of the opposition in Congress, opposed the appropriation of money to carry out the terms of the treaty. In 1797 Madison retired and enjoyed for a short while the pleasures of private life. A year later he was aroused to activity by the passage of the unpopular Alien and Sedition Acts. The Virginia resolutions written by Madison denounced these laws and declared that in case of a dangerous exercise by the Federal government of powers not granted by the compact the States had the right to interfere. These resolutions still further emphasized the position of the Republican party and pledged it to the support of States rights. The year 1801 brought an overwhelming defeat to the Federalists; Jefferson was inaugurated President and Madison became Secretary of State. He was thoroughly in sympathy with the President's views and shared the popularity of that brilliant administration. The last years of Jefferson's second term were clouded by the insulting actions of England and France with reference to the American navy. The orders of the British and the decrees of Napoleon concerning the seizure of neutral vessels were ruining American commerce. Vessels were seized by the English and by the French, American seamen were impressed, and ports blockaded. Jefferson was opposed to war and in his efforts to coerce France and England by commercial restrictions he induced Congress to lay an embargo on British trade. Instead of injuring England this seriously crippled American commerce and was soon repealed. In this troubled condition of affairs Madison became President in 1809. Like Jefferson he was opposed to war and tried diplomacy. He attempted through Erskine, the British envoy, to have the British orders in Council withdrawn. Erskine agreed, but the British government repudiated the action of its envoy. Negotiations with another British Minister, James Jackson, were also fruitless. Continued insults were heaped upon American ships and men; the country demanded definite action against the aggressors; even the peace-loving President, weary of the offensive attitude of England, at last gave his consent to war. On the 18th of June 1812 war was declared and continued with varying success until the Peace of Ghent in 1814. After nearly three years of fighting, after ruinous loss of money and property, the country was practically just where it stood in 1812, «its boundary unchanged, its international rights still undefined, the people still divided.» Madison lacked vigor as a war president, nor had he sufficient determination to secure advantageous terms of peace. He was far greater as a framer of the Constitution than as an executive.

In 1817 Madison retired from office and settled on his estates of Montpelier. He had married in 1796 Mrs. Todd, afterward the celebrated Dolly Madison, and with her he enjoyed 20 peaceful years in his country home. He was interested in farming, he thought and wrote much on all topics of public interest. He discussed social and moral questions, slavery and education. «Education,» he maintained, «was the true foundation of civil liberty.» The last public appearance of the venerable statesman was in the Virginia Convention of 1829 which met to amend the State constitution. In character Madison was thoughtful, reserved, and cautious; in a time of hard drinkers he was notably abstemious. Moderation characterized all his habits. Dignified and kindly and an excellent conversationalist among those he knew well, he made and retained warm friends. His knowledge was profound and accurate, and he was considered an authority on all constitutional matters. His literary style was labored, but his arguments were keen, comprehensive and convincing.

Consult Lives of Madison by J. Q. Adams, Rives (1859–69); Gay (1884); also ‹Letters and Writings of Madison› edited by Hunt (1900); Henry Adams, ‹History of the United States from 1801 to 1817› (1889–90).

EMILIE MCVEA,
Of the University of Tennessee.

Madison, Lucy Foster, American novelist: b. Kirksville, Mo., 8 April 1865. She was educated at the High School in Louisiana, Mo., and was married in 1890 to W. S. Madison. She has published ‹A Maid of the First Century› (1899); ‹A Maid at King Alfred's Court› (1900); ‹A Colonial Maid› (1902).

Madison, Ga., city, county-seat of Morgan County; on the Central of Georgia and the Georgia R.R.'s; about 70 miles east by south of Atlanta. It is situated in an agricultural region largely devoted to the cultivation of cotton. Its manufactures are cottonseed-oil, furniture, chairs, baled cotton, and dairy products. Madison has a large cotton trade. Pop. (1890) 2,131; (1900) 1,992.

Madison, Ind., city, county-seat of Jefferson County; on the Ohio River, and on the Pittsburg, C., C. & St. L. railroad; about 85 miles southeast of Indianapolis. Steamers ply regularly connecting Madison with river ports on the Ohio and Mississippi rivers. The city was incorporated in 1824. Its principal industrial establishments are foundries and machine-shops, lumber yards, cotton and woolen mills, flour and lumber mills, and tanneries. Madison is the trade centre for quite an extent of territory in Ohio. Its educational institutions are public and parish schools and Saint Gabriel's Academy. The government is vested in a mayor, who holds office two years, and a council. The mayor appoints the city treasurer, city clerk, and the marshal. The council elects the other administrative officials. The waterworks plant is owned and operated by the city. Pop. (1890) 8,936; (1900) 7,835.

Madison, N. J., borough, in Morris County; on the Delaware, L. & W. railroad; about 25 miles west of New York. It is a residential borough where a number of New York and Newark business men have their homes. It is one of the oldest places in the State, but was not incorporated until 1889. The principal industry is floriculture, especially the cultivation of roses. Madison is the seat of the Drew Theological Seminary; and Convent Station nearby is the seat of Saint Elizabeth's College. The park is well laid out and kept in good order. The borough is governed by a mayor and council. The term of office of the mayor is two years. The electric-light plant and the waterworks are owned and operated by the borough. Pop. (1890) 2,469; (1900) 3,754.

Madison, S. Dak., city, county-seat of Lake County; on the Chicago, M. & St. P. railroad; about 40 miles northwest of Sioux Falls. The surrounding region has good farming land, wheat being the principal crop. Considerable attention is given to stock raising. The trade is chiefly in wheat and live-stock. Madison is the seat of a State Normal College which had in attendance in 1903 about 500 students. The electric-light plant and the waterworks are owned and operated by the city. Pop. (1900) 2,550.

Madison, Wis., city, capital of the State, county-seat of Dane County; on the Chicago, M. & St. P., the Illinois C., and the Chicago & N. W. R.R.'s; about 80 miles west of Milwaukee and 120 miles northwest of Chicago. It is between Lakes Monona and Mendota and near two other beautiful lakes, Kegonsa and Waubesa; it is 790 feet above the sea and 210 feet above Lake Michigan. The place was named in honor of James Madison. The first house was erected in 1837; and after Wisconsin, in 1836, had been organized as a Territory, this site was chosen for the capital, and work on the Capitol was begun in 1837. The place was chartered as a city in 1856.

Madison is situated in an agricultural region, and has commercial interests with a number of the larger cities, also with the small towns and villages in Dane and adjoining counties. Its chief manufactures are boots and shoes, agricultural implements and tools, flour, electrical machinery, wagons and carriages, blank books, and law books. It is a famous summer resort because of its climate, lakes, and scenery. The drives are remarkable,— about 30 miles of road in the vicinity are macadamized and kept in repair by popular subscription.

Madison is noted for its educational institutions, chief of which is the University of Wisconsin (q.v.). Opposite the university is the State Historical Society headquarters, the most beautiful building in the city. It is Ionic, of Indiana limestone, and the original cost was $700,000. It contains a valuable collection of historical mementoes and the famous reference library of the society, about 245,000 volumes. It is considered one of the best historical libraries in the United States. The libraries of the Wisconsin Academy of Sciences, Arts, and Letters and of the State University are also in this building. The city free public library is housed in a building of its own, a gift from Andrew Carnegie. Just outside the city limits is the Academy of the Sacred Heart (R. C.), a boarding schools for girls, a branch of the Battle Creek Sanitarium (q.v.), and the State Hospital for the Insane. The public and parish schools maintain a high standard. The State fish hatchery is near the city. Some of the other prominent buildings are the Capitol, already mentioned, which is surrounded by a beautiful park, the county court-house and jail, a government building, and twenty-two churches. It is a favorite educational convention city. The university summer school, held each year, attracts a number of students. It was for several years the home of the Columbian Catholic Summer School, which had in attendance people from all over the United States and Canada.

The government is vested in a mayor, whose term is two years, and a council. The city owns and operates the waterworks. Pop. (1900) 19,164.

George Raymer,
President Democrat Printing Company.

and operates the waterworks. Pop. (1890) 13,426; (1900) 19,164.

Madison River, a stream in Montana which has its rise in the Rocky Mountains, at an elevation of 8,300 feet. It flows north through Madison County and unites with the Jefferson Fork of the Missouri, at Three Forks. It flows through several picturesque valleys and deep cañons; its whole course is about 230 miles.

Madison Square Garden, a large building in New York city, occupying a block or square between Madison Avenue and 4th Street, and 25th and 26th Streets. It contains an amphitheatre seating 20,000 people, and is popular for horse shows, dog shows, circuses and political and religious meetings. The building also contains a theatre, concert hall, restaurant and roof-garden. It is built of buff brick and terra-cotta and is surmounted by a great tower 300 feet in height.

Mad'isonville, Ky., city, county-seat of Hopkins County; on the Louisville & N. railroad; about 125 miles southwest of Louisville. It is in a rich agricultural region, tobacco being one of the principal productions. Coal and natural gas are in the near vicinity. The chief manufacturing establishments are a tobacco factory, tobacco stemmeries, lumber and planing mills, and flour mills. A coal mine nearby and the natural gas contribute to the prosperity of the city. Pop. (1890) 2,212; (1900) 3,628.

Madness. See Insanity.

Madoc, măd'ŏk, Welsh prince, who, in consequence of some domestic dissensions, went to sea with 10 ships, and 300 men, in 1170, and discovered America. He made a second voyage to and from this unknown land, but finally was lost to the knowledge of his countrymen. The story is to be found in Lloyd and Powell's 'Cambria' (1584), and Hakluyt gives an account of the voyages in his collection. In Owen's 'British Remains' the legend, if it is anything more, is referred to. Later travelers have imagined that they had discovered traces of these early immigrants in different parts of the country, and we have had stories of White Indians and Welsh Indians, etc. See Humboldt's 'Personal Narrative,' Book IX., note A. Southey has made Madoc the subject of an epic poem. Stephens, in 'Madoc, an Essay on the Discovery of America in the 12th Century' (1893), proves that the story of Madoc is mere baseless fable.

Madonna, mạ-dŏn'ạ (Italian), properly *my lady;* thus Petrarch often calls Laura *madonna;* but in art it is more particularly applied to the Virgin Mary. Many celebrated pictures are known under the name of Madonna, as the famous 'Madonna di Sisto' of Raphael in the gallery of Dresden.

Madoqua, măd'ō-kwạ, a diminutive antelope (*Cephalolophus abyssinicus*), one of the duiker-boks (q.v.), common in Abyssinia. The fore-parts are rufous, but gray is the prevailing hue. The same name is sometimes applied to other very small north African antelopes, as the Beni Israel.

Madras, mạ-drăs', British India, a province formerly a presidency, occupying the southern portion of the Indian peninsula. It stretches from the Bay of Bengal to the Arabian Sea, almost enclosing Travancore and Mysore, while a long, narrow portion extends along the west side of the Bay of Bengal till it meets the Bengal province about 70 miles from the mouth of the Mahánadi. It has a total area including native states of 150,798 square miles, the area of the native states being 9,475 square miles. Jaipur and Haidarabad bound it on the northwest, while the west borders for a short distance with Bombay. The chief mountain ranges are the Western Ghâts, the Eastern Ghâts, and the Nilgiri Mountains. The principal rivers are the Godáveri, and Kistna, with their tributaries; and the North Penner, South Penner, Palar, Kaveri, Coleroon, and Vaiga. There are no lakes of any importance, but many salt lagoons or inlets of the sea. Extensive forests yield teak, ebony, and other valuable timber trees. The wild animals are those common to other parts of India, the elephant, tiger, chetah, bear, bison, elk, spotted deer, antelope, jackal, wild hog, jungle sheep etc. The climate generally is reckoned the hottest in India, but differs widely in different localities according to elevation. The soil along the costs, particularly those of the Carnatic, is for the most part light and sandy; inland it consists of a decomposed syenite, impregnated with salt, which in dry weather covers the ground with a saline efflorescence. The district of Tanjore on the banks of the Coleroon is esteemed the granary of southern India. The principal vegetable productions are rice, wheat, barley, maize, and all the other grains common in India; sugarcane, areca, yam, plantain, tamarind, jack-fruit, mango, melons, cocoanuts, and a variety of other fruits; ginger, turmeric, pepper, tobacco, hemp, and cotton, for the growth of which it seems to be particularly well adapted. Tea is grown to some extent. Cotton cloth, muslins, carpets, and silks continue to be manufactured to a limited extent. The government of the presidency is vested in a governor subordinate to the Governor-general of India. The finances are in a healthy condition, the revenue usually exceeding the expenditure. At the head of the educational institutions is the Madras University, an examining body, granting degrees in arts, law, medicine, and engineering. There are various schools and colleges affiliated to the university.

The province is divided into 22 districts with a population (1891) 35,630,440; (1901) 38,208,609. The native feudatory states, Travancore, Cochin, Pudukota, Karnul, and Bellary, had a total population (1891) 3,700,622; (1901) 4,190,322. The languages are Tamil, Telugu (which are spoken by the great majority of the inhabitants), Canarese, and Malayalam, with some lesser dialects spoken by the more barbaric tribes on the mountains; Mahrathi and Gujerathi prevail in the northern and northwestern parts of the presidency; Uriya in the northeast; while Hindustani is the language spoken everywhere by the Mohammedans. Capital Madras (q.v.). See also INDIA.

Madras, British India, the capital of the province of Madras, on the Coromandel coast, lies on an open, sandy shore, exposed to the swell of the Bay of Bengal, which breaks upon the beach with great violence. A modern harbor formed by two piers obviates the former dangerous passage through the surf. The city is built on level ground and with its nine suburbs occupies 27 square miles. The chief commercial portion is Black Town, about a mile square, closely and irregularly built, containing the native and East Indian (or mixed) population, with a few European merchants and their families. On the south is the ancient Portuguese settlement Saint Thomé, with a Roman Catholic cathedral. One of the chief objects of interest is Fort St. George, which commands the Black Town and the roads, and may be considered the nucleus of the city. It was built in 1639, and is admirably situated for the defense of the town and shipping. It contains a church, the barracks, and an arsenal. The government-house, the Cathedral of St. George, and some of the other churches and public buildings, are handsome structures. Besides the University, the Presidential College, and a medical college, supported by government, there are large missionary institutions. The public park, containing a small zoological collection, is the chief recreation ground of the city. From the meridian of the observatory connected with the university all India takes its time. Madras is the chief seat of the provincial government offices, of the supreme court, a board of revenue, marine board, etc. Notwithstanding the disadvantages of its position it is a place of great trade, and a new harbor has greatly tended to increase traffic. The landing and shipping of goods is effected partly by lighters to the pier-head inside the harbor, and partly by the old *massula* or surf-boats, which land their cargoes on the beach. The imports are chiefly manufactured goods from the United Kingdom, especially cottons, wines, spirits, metals, stationery, etc. Among the principal exports are cotton, grain, indigo, coffee, tea, hides, oil-seeds, dye-stuffs, pepper, etc. The chief industries are connected with the preparation of goods for export, such as coffee pressing and cotton cleaning. Cotton-spinning factories have been established at Madras. The country at a short distance round the city, presents a remarkable contrast to its barren sandy shore, having the appearance of a fine park. The city has railway communication with all the principal places of India.

Madras was founded in 1639 by the English, who obtained the grant of a piece of ground for the erection of a town and fort from the Rajah of Chandgherry. It soon became a flourishing city and the chief station of the English on the Coromandel coast. In 1746 it was taken by the French, who kept it until 1749, when peace was made and the place was restored to the English. In 1758 it was again besieged by the French under the celebrated Lally, who was obliged to retreat after a siege of two months. Pop. (1901) 509,397.

Madrazo, mä-drä'thō, **Raimundo de,** Spanish painter: b. Rome, Italy, 24 July 1841; d. Madrid, Spain, 11 June 1894. He studied art under his father, Federigo de Madrazo, and Léon Cogniet in Paris. He was very successful in portrait and genre and numbered many prominent Americans among his sitters. He was equally happy in pastel and oils, and his ‹Fête during the Carnival› in Mrs. W. K. Vanderbilt's collection is as brilliant in conception as in technique.

Madre de Dios, mä'drĕ dĕ dē'oos, or **Amaru-Mayu,** Bolivia, a river, the chief affluent of the Beni, rising in the Carabaya Mountains, Peru, about 50 miles east of Cuzco, and after an easterly course, south by north, of 900 miles, chiefly through the Bolivian department of La Paz, uniting with the Beni at Rivera Alta, where it is 1,500 yards wide. It was explored in 1865 under the auspices of the London Geographical Society, and since 1881 has been the highway for the exploitation of the rubber forests along its course.

Mad'repore, a genus of coral-forming polyps (see CORAL) containing numerous species from the warmer and tropical seas of all parts of the earth. The true Madrepores increase by budding, the result being usually large branching colonies in which the coral between the cups containing the polyps is perforate and spiny. The different species frequently attain large dimensions and constitute one of the most important elements in the formation of coral reefs. The polyps have 12 septa and 12 tentacles, 6 being large, the other 6 smaller, while a peculiar feature is the presence of 6 U-shaped tubes connected with the œsophagus at either end. The term *Madreporaria* is sometimes used to include all polyps in which the parts are arranged in multiples of six, and which secrete coral on the external surface of the body.

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Madrid, ma-drĭd' (Sp. mä-drēd'), Spain, the capital of the kingdom and of the province of Madrid, a part of New Castile, situated near the centre of the country, on the left bank of the Manzanares, a sub-affluent of the Tagus. It is built on several low and irregular sandhills on a plateau 2,450 feet above sea-level, and is surrounded by a barren and extensive plain, treeless save in the vicinity of the city, and stretching northward to the snow-capped Sierra de Guadarrama. In winter the climate is exceedingly severe, and even in summer, when the heat is excessive, piercingly cold blasts descend from the mountains. The prevailing winds are the parching southeast *Solano*, and the icy north wind from the Guadarrama. The climate is described in a Spanish proverb as «three months of winter and nine months of hell.» The temperature ranges from 18° to 105° F.; is subject to frequent and sudden changes; and between the sunny and shady sides of a street the difference of temperature is sometimes as great as 20°. Madrid was until recently surrounded by a wall 20 feet high, pierced by 5 large and 11 small gates; of these gates 3 remain: the Puerta de Alcala on the east, the Puerta de Toledo on the south, and the Portillo de San Vicente on the west. The streets are distributed somewhat irregularly around the Puerta del Sol, which is in the centre of the capital. The principal streets are broad, long, and airy; and the houses are in general well constructed, substantial, and of good appearance.

In common with most European capitals, Madrid has undergone much modern improvement; the streets are traversed by electric and horse car lines; are lighted by gas and electricity; the telephone system is efficient; and sanitation has been much improved. The former abundant and pure water supply, is, however, inadequate to the demands of the growing population. Madrid has no edifices of great antiquity. The royal palace, situated at the western extremity of Madrid, is one of the most magnificent in the world. It occupies the site of the original Alcazar (castle) of the Moors, and is of enormous extent, being 470 feet each way, and 100 feet high. The architecture is a combination of Ionic and Doric. It contains a small but splendid Corinthian chapel, and a library of nearly 100,000 volumes, and the armory is one of the finest in the world. The chamber of deputies, which occupies an area of 42,700 square feet, has a hexastyle Corinthian portico on the grand façade, destined for the entrance of royalty on state occasions. On the two lateral façades are the entrances for the members. The Royal Exchange and the Bank of Spain are two modern imposing buildings. Madrid stands far behind many provincial towns as regards its churches, which are, with exception of a few attached to conventual establishments, poor, and of indifferent artistic merit. The church of the Almudena founded by King Alphonso XII. is in course of erection. The most important of the charitable institutions are the military hospital, an extensive building in the northwestern corner of the city; and the Hospicio of San Fernando, with schools for both sexes, the pupils being taught various handicrafts. At the southeastern corner of the city stands the general hospital, containing 1,200 beds. There are three foundling hospitals and six for orphans.

Madrid has 72 public squares, which are generally irregular both as regards their form and their edifices, as well as deficient in decorative monuments. Of these the Plaza Mayor is one of the largest and most regular. The Plaza de Oriente is adorned with 40 statues of Gothic kings, as well as those of the Asturias, Leon, Castile, and Aragon. In the centre is a fine equestrian statue of Philip IV. Among places of amusement the most popular is the Plaza de Toros (bull-ring), a building which is about 1,100 feet in circumference, and capable of containing 12,000 spectators. The Prado, a sort of wide boulevard, about 2 miles long, running north and south on the east of the city, is the chief promenade, and beyond it is the chief public park, including the Buen Retiro gardens, near which are the new handsome building for various ministerial departments, and the new station of the Southern Railway Company. The Royal Picture Gallery which stands in the Prado, contains more than 2,000 pictures, including a great many by all the best masters, especially those of Spain. There are also good pictures in the Academy of Fine Arts. The National Library, founded by Philip V., contains 500,000 volumes, is well managed, and is open to the public daily from 10 to 3. The Library of San Isidoro consists of 66,000 volumes. The University of Madrid, which arose out of that of Alcalà de Henares, founded in the 15th century, has an average attendance of 5,000 students. There are besides numerous other schools, academies, and colleges, public and private, including a normal school, a deaf and dumb institution, a normal school for the blind, a commercial school, schools for engineers, a conservatory of music, an academy for the fine arts with a gallery of 300 pictures, a veterinary college, an academy of medicine and surgery, etc. The famous monastical and palatial Escorial (q.v.) is 27 miles northwest of the city.

The industries have shown a remarkable development during the last decade, the chief manufactures being tobacco, leather goods, chocolate, beer, shoes, boots, plated ware, coaches, gloves, and fans. There is a royal carpet and tapestry factory in the Pacifico suburb. The commerce is important, as Madrid is the entrepôt for all the interior provinces. Retail business is mainly in the hands of foreigners, mostly French, but most of the wholesale trade is carried on by native houses. Madrid has railway communication with Paris and Lisbon, and the chief cities of the Peninsula.

Madrid in the Roman period probably was the insignificant hamlet Majoritum. Under the name Majorit it appears as a Moorish outpost of Toledo when captured in 932 by Ramiro II. of Leon. Henry IV. about 1461 made some additions to the older town, which was placed on the western eminence over the river. Madrid only began to be a place of importance under Charles V. Declared the seat of the court by Philip II. in 1560 the city rapidly grew up at the expense of the older and better situated capitals. It was the creation of a century, and its increase was very slow after the age of Philip IV. The gross mistake of a position which has no single advantage except the fancied geographical merit of being in the centre of Spain was soon felt, and on Philip II.'s death his son, in 1601, endeavored to move the court again to Valladolid, which, however, was found to be impracticable, such had been the creation of new interests during the outlay in the preceding reign. Madrid was entered by the French under Murat, 23 March 1808, but they were soon obliged to evacuate it. It was again held by the French from 1809 to 1812, when the Duke of Wellington entered it, and restored it to the Spaniards. After the deposition of the crown by King Amadeus in 1873, Madrid, along with the rest of Spain, suffered greatly from the anarchy caused by the struggles between the Republicans, Carlists, and Socialists. Pop. (1887) 472,228; (1900) 540,109.

Mad'rigal, a short lyric poem generally on amatory subjects. Those of Tasso represent the finest specimens of Italian poetry.

Madro'na, a large and ornamental tree of California (*Arbutus menziesii*), of the heath family, which often grows nearly 100 feet in height. It has a wide-spreading head, small evergreen leaves and the limbs and large parts of the trunk, where the thin outer bark easily peels off, are bright red. It grows in the foot hills, and up to a moderate elevation, but not naturally in the valleys. It is a near relative of the strawberry tree of Europe.

Mad'stone, a vegetable substance or stone which when applied to a wound caused by the bite of a mad dog is said to prevent hydrophobia. The most famous one in the United States is owned by the descendants of a family named Fred, in Virginia. This stone was brought over from Scotland in 1776. It is said to be the one spoken of by Sir Walter Scott in 'The Talisman' and has been religiously preserved as one of the most valuable relics of the age. It is about two inches long by one inch broad, and about half an inch thick, and is of a chocolate color. When applied to the wound it adheres till all the poison is absorbed, when it drops off. It is then soaked in warm milk or water for a time, and when removed the liquid is found to be full of a greenish-yellow scum. It is said that of the 130 cases in which it has been applied for the bite of a mad dog, none ever suffered from hydrophobia. There are said to be three authenticated madstones in the United States.

The belief in a madstone was common hundreds of years ago in the East, and travelers in India in 1677 and 1685 make mention of it. Tradition said it grew on the head of certain snakes. George T. Kunz, a New York expert in gems, identifies the madstone, or snakestone, of the East, with the stone known as tabersheer, which is a variety of opal found in the joints of the bamboo in Hindustan and Burma. This stone is formed of juice which by evaporation becomes mucilaginous, then a solid substance, and when placed in the mouth will adhere to the palate or cause water to boil. Sir David Brewster says it is found in the joints of diseased corn-stalks and is formed by sap depositing silica.

Madura, mä-doo'rä, southeastern Asia, an island of the Malay Archipelago, off the east end of Java, from which it is separated by the Strait of Madura. The island is about 105 miles long east to west, and 30 miles broad, with an area of 1,770 square miles. Madura forms one of the 17 Dutch residencies or provinces into which Java and Madura are divided, and is administered by a governor or resident. The Dutch first landed in Madura in 1747. It is undulating, but not mountainous, and though in general well watered, in some places, especially on the coast, there is a want of water, and the soil is unfertile. The interior, however, is fertile, though not so productive as Java. Maize, cocoanuts, tobacco, Jamaica pepper, tamarinds, and salt are the chief products; stock-raising is an important industry; and the exports include also birds'-nests, country cloths, white and striped, poppy-oil, rattan-mats, and baskets, etc. The chief towns are Bangkalang, Pamekasan (the capital), and Sumanap. Pop. (1897) 1,652,580, of whom 4,252 were Chinese, 558 Europeans and the rest natives.

Madura, southern India, the capital of a district of Madras, 344 miles by rail southwest of Madras. It was the capital of the ancient Pandhyan kingdom, for over 2,000 years was the political and religious capital of southern India, and is noted for its interesting architectural monuments, chief of which is the Temple of Minarchi, dating from almost prehistoric times, restored and added to by Tirumulla Nayak (1622–62). It ranks fourth among the seven strongholds of Hinduism, and occupies a parallelogram of 56,000 square feet containing 50 buildings. Madura is the seat of Catholic and American Protestant and other missions, and has several high-grade educational institutions. Pop. (1901) 105,501.

Madvig, mäd'vĭg, **Johan Nikolai,** Danish scholar: b. Svanike, island of Bornholm, 7 Aug. 1804; d. Copenhagen 13 Dec. 1886. Educated at Frederiksborg and Copenhagen, he was from 1829 till 1879 professor of Latin in the University of Copenhagen. He took a profound interest in the politics of his country, and from 1848 till 1851 was minister of education and religion. He is best known by critical editions of Latin classics and by his Latin grammar translated into English and most European tongues. His chief works are: ‘Emendationes in Ciceronis Libros Philosophicos’ (1828); ‘Cicero's De Finibus Bonorum et Malorum’ (1839, amended 1876); ‘Ciceronis Orationes Selectæ Duodecim’ (1830); ‘Cicero's Cato Major and Lælius’ (1835); ‘Opuscula Academica’ (1834–42; new edition 1887); ‘Emendationes Livianæ’ (1860); ‘Livii Opera’ (with Ussing, 1861–6); ‘Adversaria Critica’ (1871–84); ‘Latin Grammar’ (1841); ‘Greek Syntax’ (1846); ‘Constitution and Administration of the Roman State’ (1881–2); ‘Autobiography’ (1887).

Mæander, mē-ăn'dėr, now **Mendere**, Asiatic Turkey, a river which rises in Phrygia not far from Celænæ. It forms the boundary between Caria and Lydia, and flows into the Icarian Sea between Priene and Myus, opposite Miletus. It was celebrated among the ancients for its winding course, and gave its name to the intertwined purple borders on mantles and other dresses, as well as upon urns and vases.

Mæandrina, mē-ăn-drī'na̤, one of several genera of brain corals, so called from the elongate and meandering cups containing the polyps, which give a spherical mass of these corals an appearance strikingly like the human brain with its convolutions. This appearance is due to the fact that the polyps in their growth do not completely divide, but stretch out into long bands, frequently branching, with many mouths and tentacles, and a common body and digestive cavity. Brain corals occur in all tropical seas, several species being found in Florida and the West Indies. Their solid masses make them important factors in the formation of coral reefs.

J. S. Kingsley,
Tufts College.

Mæcenas, mē-sē'na̤s, **Gaius Cilnius**, Roman nobleman: b. between 73 and 63 B.C.; d. 8 B.C. He was the friend of Augustus, and patron of Virgil and Horace. Though it is unknown where he received his education, it must have been a good one, for he was intimate with the literatures both of Greece and Rome, and was himself an occasional writer in prose and verse. We first hear of him authentically (40 B.C.) as negotiating a marriage between Octavianus and Scribonia; and in the same year he contributed materially to bring about the Peace of Brundisium, by which Cæsar and Antony were reconciled. Two years later he was again employed in reconciling these self-willed potentates; and 36 B.C. he was twice despatched by Octavianus from Sicily to Rome to quell disturbances which had broken out there. He was for these services entrusted with the administration not only of Rome, but of all Italy. His palatial residence and gardens on the Esquiline were the rendezvous of all the *literati* of Rome, and of numerous parasites. But those admitted to his intimacy were the greatest geniuses and scholars of Rome, among them being Virgil and Horace. To the intercession of Mæcenas, Virgil was indebted for the recovery of his farm, and Horace also owed to him many favors.

Maelar, Lake of. See Mälar.

Maelstrom, māl'strŏm, or **Moskoe-strom**, Norway, a rapid current or tidal whirlpool off the northwest coast immediately southwest of Moskenesoe, the southernmost of the Lofoten Isles. The current runs with the tides alternately, six hours from north to south and six hours from south to north, producing immense whirls. The depth of the water around, supposed at one time to be too great to admit of soundings, has been ascertained not to exceed 20 fathoms, with a bottom of rocks and white sand. Immediately to the west the soundings are from 100 to 200 fathoms. The whirlpool, idealized by mediæval and later writers including Edgar Allan Poe, is greatest at high or low water. When the wind is northwest and opposed to the reflux of the waves it attains its greatest fury, and becomes extremely dangerous, but in ordinary circumstances it may be traversed without difficulty.

Maestricht, mäs'trĭHt, Netherlands, the capital of the province of Limburg, on the left bank of the Maas, at the confluence of the Geer, lies on the Belgian frontier, 56 miles east of Brussels, and 52 miles west by south of Cologne. Among the chief buildings are the church of St. Servais, partly Romanesque and partly Gothic, dating from the 10th century; the town-hall; the courts and general prison, and the arsenal. The fortifications were dismantled between 1871 and 1878; it is, however, still a considerable garrison town. Maestricht carries on an active transit trade with Belgium, and has manufactures of glass and earthenware, firearms, shot, cloth, and paper-hangings; also iron-foundries, beet-root sugar refineries, tobacco and cigar factories, tan-pits, distilleries, and breweries, the latter producing very noted beer. About three miles from the town is the Pietersberg (Peter's Hill), on which stands the fort of St. Pierre, and under which are extensive subterranean quarries, supposed to have been excavated by the Romans. Maestricht was besieged and taken, and 8,000 of its inhabitants were massacred in 1579, by the Spaniards, under the Duke of Parma; in 1673 it was taken by Louis XIV., and again by the French in 1748 and 1794. William III. of England failed to take it; and in 1830 its garrison resisted successfully the attacks of insurgent Belgians. Pop. (1901) 34,182.

Maestricht Beds, in geology, a series of calcareous beds 100 feet thick, on the banks of the Meuse, near the Dutch city of Maestricht. The Maestricht calcareous rock contains *Belemnitella, mucronata, Pecten quadricostatus*, etc., also the genera *Braculites, Hamites*, etc., which are only Mesozoic. It is a connecting link between the Secondary and the Tertiary rocks, but in all essential respects belongs to the former.

Maeterlinck, mĕt'ėr-lĭnk, **Maurice** (Gallicized from the original Mooris Măterlinck), Belgian author: b. Ghent 29 Aug. 1862. He was educated in a Jesuit school in Belgium, then studied law, was admitted to the bar in 1887, but was from the first more interested in letters, and in 1896 settled in Paris as an author. His work may be divided into three parts,— his lyric verse, his dramas, and his philosophical essays. Of the first the two volumes ‘Serres Chaudes’ (1889), and ‘Douze Chansons’ (1896) are representative. Maeterlinck's verse is imaginative, but lacks in any strong degree the melodic quality. His dramas are: ‘La Princesse Maleine’ (1889); ‘Les Aveugles’ (1890); ‘L'Intruse’ (1890); ‘Les Sept Princesses’ (1891); ‘Pélleas et Mélisande’ (1892); ‘Alladine et Palamides’ (1894); ‘La

Mort de Tintagiles' (1894); 'Aglavaine et Sélysette' (1896); and 'Monna Vanna' (1902). Several of these were translated into English by Richard Hovey (q.v.), and 'Monna Vanna' was rendered by Alexis I. du P. Coleman. The dramas are Maeterlinck's most striking work. Their eery symbolism can hardly be explained, but must be appreciated at first hand. Though they inaugurated a new theatric school — the 'Drame Intime' — they are properly reading plays, and lose their mystery and impressiveness in presentation. 'Pelleas et Mélisande' was given in the United States by Mrs. Patrick Campbell. To many the essays are the most interesting things that Maeterlinck has done. The volumes are 'Le Trésor des Humbles' (1896); 'La Lagesse et la Destinée' (1898), and 'La Vie des Abeilles' (1902). The first is somewhat mystical, all are somewhat diffuse; but he has been called by virtue of them a true successor of Swedenborg and Böhme.

Mæviad and Baviad. See BAVIAD.

Mafeking, mä-fā-kĭng' or măf'ĕ-king, Cape Colony, a former Bechuana settlement, now a town, the administrative seat of the Bechuanaland protectorate, close to the borders of the Transvaal, 870 miles by rail northeast of Cape Town and about 200 miles west-southwest of Pretoria. The town stands near the upper Malopo River, and contains several substantial buildings, including a Masonic temple, a town-hall and a hospital, and there is a good water-supply, a swimming-bath, and a race-course. Mafeking sustained a protracted siege during the South African War of 1899–1901. It was isolated in October of the former year, and was brilliantly defended by a small force under Colonel (now General) Baden-Powell, until relieved by Colonel Mahon in May 1901.

Maf'fitt, John Newland, American clergyman: b. Dublin, Ireland, 28 Dec. 1794; d. Mobile, Ala., 28 May 1850. He was a Wesleyan preacher in Ireland and in 1819 emigrated to the United States, where he became a member of the New England Methodist Episcopal conference. He founded the 'Western Methodist' in Nashville in 1833 and conducted revivalist meetings throughout the South and West. In 1837 he became professor of elocution and belles-lettres at La Grange College, Louisiana, and in 1841 he was elected chaplain to Congress. He published several religious works, also an autobiography.

Maffitt, John Newland, American naval officer: b. at sea 1819; d. 1886. He enlisted in the United States navy in 1832 and in 1861 entered the service of the Confederacy where he took rank as commodore. In command of the Florida he rendered himself valuable to the Confederate cause, taking many prizes and damaging seriously United States commerce. Owing to ill-health he resigned before the end of the War.

Mafia, mä-fē'ä, a Sicilian secret society similar to the Camorra, which has long existed in Naples, but much more powerful. The Mafia is essentially a form of organized lawlessness, but its organization is sufficiently elastic to baffle all the attempts of the government to suppress it. It is generally said to have had its origin in the *compagni d'armi,* a kind of police organized in Sicily early in the 19th century and dissolved by Garibaldi in 1860. Its members, who are required to prove their daring in a knife duel, are bound never to carry their suits to the regular courts or to give evidence before them. Murder and robbery are discountenanced under ordinary circumstances, but they are resorted to without hesitation in the case of informers or specially obnoxious persons. Blackmail is levied from land-owners, who are required to employ only *mafiosi* in certain occupations. Criminals are protected and elections controlled by this infamous society, whose authority is greater than that of the law among the lower classes in Sicily. The Chinese highbinder societies are similar to the Mafia. Within recent years these murderous organizations have secured a footing in the United States, and murders directly chargeable to the Mafia have been committed in New York, New Orleans, Chicago, and other large cities.

Magalhães, Domingos José Gonçalves de, dō-mēn'gō hō-sā' gôn-säl'vĕs dā mä-gäl-yä'-ĕns, VISCOUNT D'ARAGUAYA, Brazilian poet and diplomat: b. Rio de Janeiro 13 Aug. 1811; d. Rome, Italy, 10 July 1882. He was admitted to the bar, but entered the Brazilian diplomatic service in 1836, and was minister at Vienna, at Washington (1868–72), and at Rome. He is rated among the foremost of Brazilian poets. His best-known work is the 'Confederacão dos Tamoyos' (1857), based on historical events in early Brazil. Among his other volumes are 'Mysterios' (1858) and 'Urania' (1862); and he wrote also philosophical treatises and successful tragedies. A collected edition of his works was published in 1876.

Magalhães, Fernão de. See MAGELLAN, FERDINAND.

Magallanes, mä-gäl-yä'nes, Chile, a territory lying south of the Department of Chiloe, and includes the many islands, large and small, along the western and southern coasts of Chile. Its entire area is over 80,000 square miles. Among the more prominent islands in the territory are the Wellington group, Hanover group, Queen Adelaide Archipelago, Madre de Dios and a part of Tierra del Fuego. The mainland is a narrow strip of mountainous sea-coast. Pop. about 6,000.

Mag'dala, Abyssinia, a town and fortress on a plateau nearly 9,000 feet above the level of the sea, about 120 miles southeast of Gondar, on the left bank of the Bashilo, an affluent of the Blue Nile. A wall of columnar basalt, varying from 30 to 700 feet high, surrounds it on every side. Magdala acquired notoriety from its having been stormed in 1868, by the British troops under Sir Robert Napier, afterward Lord Napier of Magdala. (See ABYSSINIA.) The Abyssinians had deemed their fortress impregnable.

Magdalen, măg'da̤-lĕn, a name applied to one of the Marys in the Gospels, derived from her place of birth, or former residence, in order to distinguish her from other women of that name (Matt. xxvii. 56, 61; Mark xv. 40, 47; Luke vi. 2; John xix. 25).

Magdalen (măg'da̤-lĕn or môd'lĭn) **College,** Oxford, England, originated in Magdalen Hall, founded in 1448 by William Patten, commonly called William of Waynflete, from the place of his birth, Bishop of Winchester and Lord High-chancellor of England, who 10 years later added

College of Saint Mary Magdalen. In some ects Magdalen is the most noteworthy college he university. Five of the fellowships are :hed to five Waynflete professorships, of al philosophy, chemistry, mineralogy, physi- y, and pure mathematics, established in lieu :he three former lectureships of divinity, al philosophy, and natural philosophy. There so a professorship of botany. The buildings noted for their beauty and occupy extensive ınds. Among Magdalen's celebrated alumni Addison, Foxe, Gibbon, Hampden, Lily, ', Philpotts, Selborne, Tyndale, and Wolsey.

Magdalen (măg'dạ-lĕn) **Islands,** Quebec, ıda, near the centre of the Gulf of St. Lawe, 54 miles northwest of Cape Breton, Nova ia, and 100 miles southwest of Newfound- . Amherst, Alright, Coffin, Wolf, Grind- e, Deadman, Entry, and Byron islands com- the group which are politically attached to district of Gaspé, Quebec. The inhabitants : chiefly by the fisheries of the adjacent :rs; gypsum which is found in veins and ›ws, and grindstones from Grindstone is- , are exported. House Harbor on Alright ıd, and Amherst where there is a custom- e, are the chief settlements. Pop. 3,200.

Magdalena, māg-dä-lā'nä, a river of Co- ›ia, South America, which has its rise in Andes Mountains in the southwestern part Colombia, and flows north to the Caribbean A short distance from the sea, at the city of anquilla, the river divides and discharges its rs through two channels. It is about 1,000 s in length. It is navigable for ocean steam- to Barranquilla, and for small steamers to da, about 600 miles from its mouth. Navi- ›n is obstructed at Honda by a series of and rapids; and a railroad, about 22 miles has been built along the river to a point e the rapids, from which the river is navi- : up the stream for about 200 miles to a. Magdalena River is the principal route . the sea to the interior of the country. ›ta (q.v.), the capital, is at present (1903) ly dependent upon this river for means ommunication with places on the coast. largest tributary is Cauca, whose source :ar that of the Magdalena, and part of its se is almost parallel with the main river. t railroads connect some of the interior s with the river and its tributaries.

Magdalena (măg-dạ-lē'nạ) **Bay,** an inlet ıe west coast of Lower California, in Mex- ›ne of the best harbors on the Pacific coast. inlet or arm of the sea is about 40 miles and is protected by a long low sand-bar. ›wn of the same name is situated on the ›r.

Magdalene (măg'dạ-lĕn) **College,** Cam- :e, England, was founded in 1519 by nas, Baron Audley of Walden. There are ı open fellowships on the foundation, and pen scholarships. There are also several ›itions. The annual Pepysian benefaction, : £50, is in the master's gift, and is usually wed upon poor and deserving students. buildings consist of two courts, restored altered in 1880, a chapel and hall dating the 15th century, and the Pepysian Library, in 1688.

Magdeburg, măg'dĕ-boorg, Germany, city, capital of the Prussian province of Saxony; on the Elbe, about 80 miles southwest of Berlin. The manufacturing and trade of Magdeburg are extensive, and its facilities for transportation by water and railroad are excellent. Among its industrial establishments are the Gruson Works, noted for their connection with the Krupp Works, the beet-sugar factories, and a number of other establishments. It has a large number of excellent schools, gymnasia, a pedagogical seminary, art schools, industrial schools, etc. Magdeburg is a place of great antiquity, being a trading centre in the 9th century. It ea tinguished itself in the Reformation. the Thirty Years' war the town was b stormed, and sacked by Tilly, when 20 sons are said to have been murdere (1902) 230,491.

Consult: Wolter, 'Geschichte der St deburg'; Dodge, 'Gustavus Adolphus.'

Magdeburg Hemispheres, a celeb vention of two hollow hemispheres, made copper or brass, with their edges accurately fitted to each other, and one of them furnished with a stopcock. When the edges are rubbed over with grease, pressed tightly together, and the globe thus formed exhausted of air through the cock, the hemispheres, which fell asunder before exhaustion, are now pressed together with immense force. If they are one foot in diameter, they will, after exhaustion, together with a force of nearly a experiment was first performed by Guericke of Magdeburg, in 1650, at t diet at Ratisbon, to the astonishm Emperor Ferdinand III. and the roya

Magellan, ma-jĕl'ạn, **Ferdinand** guese FERNÃO DE MAGALHÃES or MAC Portuguese navigator: b. probably at Villa de Sabroza, Trazos-Montes, about 1470; d. Philippine Islands 27 April 1521. He served in the Indies with distinction, especially at Malacca, and in 1514 saw service in Morocco. In resentment at his treatment by the king, who had not, he thought, duly rewarded his services, he, with Ruy Falero, a geographer and astronomer, renounced his nationality and offered his services to Spain. Magellan's proposal to seek a western route to the Moluccas was accepted by Charles V., and on 20 Sept. 1519, he set sail from San Lucar de Barrameda in command of five vessels. He passed through the strait which bears his name (see MAGELLAN, STRAIT OF), and on 28 Nov. 1520, reached the great ocean which he called the Pacific from *its calmness*. With his three remaining vessels he sailed by way of the Ladrones Islands to the Philippines, discovering Samar on 16 March 1521. He caused the king of Zebu to swear allegiance to Spain, but was killed in a fight with the natives of Matan. His vessel, the Victoria, under Sebastian del Cano, completed this, the first circumnavigation of the globe. The chief authority for the voyage is a work by Pigafetta, an Italian who accompanied Magellan.

Consult: Lord Stanley, 'The First Voyage Round the World' (1875); and Guillemard, 'Ferdinand Magellan' (1891).

Magellan, Strait of, the *channel which* separates the continent of South *America from* Tierra del Fuego and thus forms *a communication* between the South Atlantic and the *South*

LAKE MAGGIORE.

Pacific Oceans. It is upward of 360 miles long, and is of difficult navigation. Its breadth varies exceedingly, the maximum being somewhat over 70 miles. There are a number of bays along the shore and at the southwestern end, a group of several small islands. Punta Arenas is the best harbor. The strait was discovered in 1520 by Fernando Magalhães or Magellan.

Magellan′ic Clouds, in astronomy, called the Nubeculæ, Major and Minor, from their cloud-like appearance, two oval masses of light in the southern hemisphere near the pole; often both visible to the naked eye. Sir J. Herschel describes them as consisting of swarms of stars, clusters, and nebulæ of every description.

Magendie, François, frăṅ-swä mä-zhŏṅ-dē, French physician and physiologist: b. Bordeaux 15 Oct. 1783; d. Paris 8 Oct. 1855. He was the pupil of the celebrated surgeon Boyer, and at 20 was appointed successively *aide d'anatomie* in the faculty of medicine, and demonstrator. He, however, subsequently devoted himself principally to the practice of medicine, was in 1819 elected a member of the Academy of Sciences, and in 1831 succeeded Récamier in the chair of anatomy in the College of France, which he retained until his death. As an experimenter in physiology he occupied a high position, and his experiments on living animals were at one time so numerous and involved so much suffering to the animals, that the French government deemed it necessary to interfere. The results obtained, however, were of great importance, if they do not absolve him from the charge of cruelty. Among them may be named an original demonstration that the two roots of the spinal nerves are devoted to two separate functions; that the veins are organs of absorption; that strychnine acts upon the spinal cord and contracts by tetanic spasm the nerves of respiration, thus inducing asphyxia; that food destitute of nitrogen is not nutritious; and that prussic acid is a valuable remedy in certain forms of cough arising from irritation in the lungs. He was a prolific author of medical works, the most important of which are: ‘Formulaire pour la Préparation et Emploi de plusieurs nouveaux Médicaments’ (1821), containing an account of the effects of certain plants then recently introduced into the materia medica, and which has been translated into all the languages of Europe; ‘Précis élémentaire de Physiologie’ (1816–17), for many years an important manual for students; ‘Leçons sur les Phénomènes physiques de le Vie’ (1836–42); ‘Leçons sur les Fonctions et les Maladies du Système nerveux’ (1839); ‘Leçons sur le Sang’ (1839).

Magenta, mä-jĕn′tä, Italy, town in the province of Milan, 14 miles east of Milan, is situated in a grape region, in which the cultivation of grapes and mulberries and the manufacture of wine are the principal industries. Considerable raw silk is exported. It was the scene of a famous engagement 4 June 1859 between the French and Sardinian forces, and the Austrians. The Austrians were defeated, largely through the superior tactics of General MacMahon (q.v.) of the French army. Pop. (1901) 7,974.

Magenta, or **Aniline Red,** a coal-tar dye, which consists of a mixture of the hydrochlorides of rosaniline and para-rosaniline. (See ROSANILINE.) It may be prepared from aniline oil by digesting the aniline with arsenic acid, or with nitrobenzene and ferrous chloride. When the oxidation is complete, the rosaniline hydrochloride is precipitated by the addition of common salt in large excess, the hydrochloride being formed by double decomposition, and thrown down because it is but sparingly soluble in salt solutions. Consult Benedikt, ‘Chemistry of the Coal-Tar Colors.’)

Maggiore, mäd′jō′rĕ, **Lake,** one of the largest lakes in Italy, the *Lacus Verbanus* of the Romans, is situated for the most part in Italy, but also partly in the Swiss canton of Ticino. It is 39 miles in length, and varies in breadth from one half mile to five and one half miles. It is 646 feet above the level of the sea and has a maximum depth of 1,158 feet. The river Ticino flows through it. In a southwestern expansion of the lake are the Borromean Isles (q.v.). On the north and west it is surrounded by granitic mountains, 7,000 feet high, on the south and east by vineyard-covered hills. On its shore are a large number of villages and cities noted for beautiful scenery and historic connections.

Maggot, the larva of a fly. (See FLIES).

Magi, mā′jī, an Accadian term recently brought to light by Assyrian scholars; Accadian being the language of the people of Babylon and Media. The word signifies «august,» «reverend,» and was the title of their learned and priestly caste. The Semitic nations afterward dominant in Babylonia and Assyria adopted the learning and many of the religious observances of the early inhabitants, as also the name for the learned caste; and out of the Semitic form the Greeks made *magos.* Under the Persian empire the magi were not only the «keepers of the sacred things, the learned of the people, the philosophers and servants of God,» but also diviners and mantics, augurs and astrologers. They were held in the highest reverence, and no transaction of importance took place without or against their advice. Hence their almost unbounded influence in both private and public life. Apart from the education of the young princes being in their hands, they were the constant companions of the ruling monarch. Zoroaster, in the course of his great religious reform, reorganized the body of the magi, chiefly by reinforcing the ancient laws as to their manner and mode of life, which was to be one of the simplest and severest, befitting their sacred station, but which had become one of luxury and indolence, and by re-instituting the original distinction of the three classes of *herbeds* («disciples»), *mobeds* («masters»), and *destur mobeds* («complete masters»). The food, especially of the lower class, was to consist only of flour and vegetables; they wore white garments, slept on the ground, and were altogether subjected to the most rigorous discipline. The initiation consisted of the most awful and mysterious ceremonies, and was preceded by purifications of several months' duration. Gradually, however, their influence, which was all-powerful during the epoch of the Sassanian kings of Persia, began to wane, and, from being the highest caste, they fell to the rank of wandering jugglers, fortune-tellers, and quacks, and gave their name to sleight-of-hand and conjuring tricks. But the name seems to have been also current as a generic term for astrologers in the East, as is evidenced by the New Testament narrative of the homage of the Magi to the Infant Christ. According to the narrative (Matt. ii. 1-12) the three wise men came from the East to Jerusalem, led by a star, which at length guided them safely to the place of the Nativity at Bethlehem, where they offered their gifts of gold, frankincense, and myrrh. As the "Three Kings" their names became celebrated in the Middle Ages, and Bede distinguishes them as Kaspar, Melchior, and Balthasar. See also PARSEES; ZOROASTER.

Magic, or **Black Art**, was formerly the means of producing supernatural effects with the assistance of evil spirits. Supernatural effects were at an early period naturally associated with the exercise of the healing art. In the rudest stages of society this was confined to the women, and naturally arrived at the dignity of a profession in the hands of the older, whom experience had gifted with superior skill. As their art was for the most part a mystery to themselves, they gradually came to be regarded as objects of fear as much as of hope, and magic medicines became synonymous with poison. The sorceress, poisoner, and witch were in time reckoned identical. (See WITCHCRAFT.) Media, Persia, and the neighboring countries, famous for their knowledge of astronomy and astrology, are described as the chief seats of the ancient Magi, whose doctrine seems to be, in part, of great antiquity. This doctrine represented opposition or strife as the parent and original cause of all things. After the opposition between light and darkness, Ormuzd and Ahriman, was established, the whole series of finite beings, the whole sensual world, proceeded from this constant struggle of light and darkness, good and evil. The change of day and night, light and darkness, the whole series of ages, time itself, is only a consequence of this struggle, in which sometimes light, sometimes darkness, appears victorious, until finally light shall conquer for ever. If all finite things stand under the influence of preserving and destroying powers in nature, it is clear that he who could master these powers could dispose at his pleasure of the things subject to them; and the doctrine of the Magians was that by prayer and a true knowledge of those laws of opposition, love and hatred, light and darkness, such power could be obtained; and that thus also it was possible to pry into futurity. But it was believed that as the world became sinful the light of the ancient doctrine of the Magi was obscured, and those who bore the name became at last only evil-disposed sorcerers. One important branch of their art was now the excitement of love by potions and enchantments. Their love-potions consisted partly of ingredients which are still known to the physicians as stimulants, partly of parts of animals who had died longing for food or air, or the saliva of hungry dogs, and other still more disgusting substances. Magic at this period also occupied itself with fortune-telling, calling up the dead and bewitching by the look — a superstition which we find existing in the processes against witches in modern times. It can hardly be doubted that the art of the ancient magicians was founded to a considerable degree upon a knowledge of the powers of nature superior to that of the general public. At one time magic was greatly studied in Europe, and many distinguished names are found among its students and professors. The most famous of these are Albertus Magnus, Roger Bacon, Cornelius Agrippa, Michael Nostradamus, John Dee, William Lilly, etc. Consult: Ennemoser, 'History of Magic'; Scott, 'Demonology and Witchcraft'; Mackay, 'Memoirs of Extraordinary Popular Delusions'; Regnault, 'La Sorcellerie, ses Rapports avec les Sciences biologiques' (1897); Lehmann, 'Aberglaube und Zauberei' (1898).

Magic Lantern, an optical instrument for the enlarged representation of small figures. The instrument consists of a lantern, generally of tin, and cubical in form, having in the interior a powerful Argand lamp, the pencils of light issuing from which pass through a convex lens. It is most commonly used as a toy, but it is also valuable for the purposes of science in enlarging astronomical and other diagrams to illustrate lectures, so that they may be seen by an audience. The principle of its construction is very simple. A lamp is placed within the closed lantern with its burner in the focus of a concave mirror, the reflected light from which passes through a horizontal tube on a level with the flame. This tube contains two lenses, the one a hemispherical illuminating lens, of short focus, to condense a strong light on the picture, and the other a double convex lens, which receives the rays after they have passed through the picture, and throws them on the screen. The picture is inserted through a transverse slit into the tube between the lenses. That the representation may appear erect the picture must be inserted into the tube in an inverted position. The screen must not be too far removed from the lantern, otherwise the image will become indistinct and distorted. The tube is made to pull out, so that the distance of the lens from the slider being capable of being increased or diminished, an image of any moderate size, larger or smaller, may be formed, by increasing or diminishing the distance between the lantern and the screen.

Magic Square, in mathematics, a term applied to a series of numbers in arithmetical progression, arranged in the equal cells of a square, in such a manner that the vertical, horizontal, and diagonal columns shall give the same sums. The methods given for constructing them are divided into different rules, but no general method has yet been found that shall apply to all cases. The first sixteen numbers are arranged as a magic square in the annexed table:

1	16	11	6
13	4	7	10
8	9	14	3
12	5	2	15

There are said to be 880 methods of making these magical squares, and only those squares are included which are essentially different.

«Magic circles,» «cubes,» «cylinders,» etc., are also constructed.

Maginn, mạ-gĭn′, **William**, Irish author: b. Cork, Ireland, 11 Nov. 1793; d. Walton-on-Thames, 20 Aug. 1842. He was graduated from Trinity College, Dublin, in 1811, and was for some years a school-master. In 1819 he became a contributor to ‘Blackwood's Magazine’ and was in turn Paris correspondent of the ‘Representative,’ junior editor of the ‘Standard,’ and one of the founders of ‘Fraser's Magazine,’ his contributions to which made it famous. He was a man of superb classical education, excelled as a critic, and his literary work abounded in rich fancy and the genuine Irish wit. Unfortunately he had no financial ability and he died in extreme poverty notwithstanding the large sums his pen had earned. His collected works were published in 5 vols. in 1855–7.

Magistrate. See Court.

Magliabecchi, Antonio, ăn-tō′nē-ō măl-yă-bĕk′ē, Italian bibliographer: b. Florence 28 Oct. 1633; d. there 4 July 1714. In the early part of his life he was engaged in the employment of a goldsmith, which he relinquished to devote himself to literary pursuits. Through unremitting application he acquired a multifarious stock of erudition, which made him the wonder of his age. Duke Cosmo III. made Magliabecchi keeper of the library which he had collected, and gave him free access to the Laurentian Library and the oriental MSS., and of the latter collection he published a catalogue. He left no literary work, but freely afforded information to authors who sought his assistance in their own undertakings, his prodigious memory enabling him to furnish the exact reference to any page or paragraph of the numberless volumes he had read. He left his valuable private library of 30,000 volumes to his native city where it now forms part of the National Library.

Magna Charta, măg′nạ kär′tạ, or **Great Charter of Liberties**, a famous document extorted from King John of England by the confederated barons in 1215. The barons who with their followers composed «the Army of God and the Holy Church» were the whole nobility of England; their followers comprehended all the yeomanry and free peasantry, and the accession of the capital was a pledge of the adherence of the citizens and burgesses. John had been obliged to yield to this general union, and in June both parties encamped on the plain called Runnymede, between Windsor and Staines, on the banks of the Thames, and conferences were opened between the king and his barons. The preliminaries being agreed on, the barons presented heads of their grievances and means of redress, in the nature of the bills now offered by both houses for the royal assent. The king, according to the custom which then and long after prevailed, directed that the articles should be reduced to the form of a charter, in which state it issued as a royal grant. The charter was signed on 15 June. Copies were immediately sent to every county or diocese, and ordered to be read publicly twice a year. To secure the execution of the charter John was compelled to surrender the city and Tower of London, to be held by the barons till 15 August, or until he had completely executed the charter. Many parts of the charter were pointed against the abuses of the power of the king as lord paramount; the tyrannical exercise of the provisions of the forest laws was checked, and many grievances incident to feudal tenures were mitigated or abolished. But beside these provisions it contains many for the benefit of the people at large, and a few maxims of just government, applicable to all places and times, of which it is hardly possible to overrate the importance of the first promulgation by the supreme authority. The 39th article contains the celebrated clause which forbids arbitrary imprisonment and punishment without lawful trial. This article contains the writ of *habeas corpus* and the trial by jury, the most effectual securities against oppression which the wisdom of man has devised, and the principle that justice is the debt of every government, which cannot be paid without rendering law cheap, prompt, and equal. The provision which directs that the supreme civil court shall be stationary, instead of following the king's person, was an important safeguard of the regularity, accessibility, independence, and dignity of public justice in Great Britain. The Great Charter was frequently confirmed: four times by Henry III., and no fewer than 13 times by Edward III. Consult Stubbs, ‘Constitutional History of England’ (1897).

Magna Græcia, grē′shĭ-ạ, «Great Greece,» the name commonly given in ancient times to that part of southern Italy which was inhabited by Greek colonists. Apparently the name was in use as early as the time of Pythagoras (586–506 B.C.). Strabo includes the Greek cities of Sicily under the appellation, but the name refers generally only to the Greek cities in the south of Italy, including those on the shores of the Tarentine Gulf and the Bruttian Peninsula, with Velia, Posidonia, and Laüs, on the west coast of Lucania. The name was not at first territorial, or co-extensive with any region, but applied merely to the Greek cities on the coasts. Cumæ was the most ancient of all the Greek settlements in Italy, but from its remote position it was in a great measure isolated from the later Greek settlements. The Achæans were the real colonizers of southern Italy, their first settlement being Sybaris (720 B.C.). A few years later (708 B.C.) Spartan colonists founded Tarentum, and to counteract their encroachments the Achæans founded Metapontum, on the frontier of the territory of the Tarentines, between 700 and 680 B.C. The Locrians founded further south the city known as Locri Epizephyrii, nearly contemporary with Crotona (710 B.C.). The Chalcidic colony of Rhegium, on the Sicilian Straits, claims to have been more ancient even than Sybaris. The Greek cities on the shores of Bruttium and Lucania were, Velia excepted (540 B.C.), offshoots from the earlier settlements, and not founded by colonists direct from Greece. The arrival of Pythagoras at Crotona (530 B.C.) produced a marked change in the cities of Magna Græcia, and led to the introduction of great political changes. He and his followers were ultimately expelled from Crotona. Magna Græcia comprised the provinces of Campania, Apulia, Iapygia, Lucania, and Bruttium.

Magnalia Christi Americana, măg-nā′lĭ-ạ krĭs′tī ā-mer-ĭ-kā′nạ, an ‘Ecclesiastical History of New England, from 1620 to 1628,’ published by Cotton Mather in 1702. It treats more extensively of the early history of the country than its title seems to indicate, and is divided into seven books: the first treating of the early discoveries of America and the voyage to New England; the second is ‘Lives of the Governors’; the third, ‘Lives of many Reverend, Learned, and Holy Divines’; the fourth, ‘Of Harvard University’; the fifth, ‘The Faith and the Order in the Church of New England’; the sixth, ‘Discoveries and Demonstrations of the Divine Providence in Remarkable Mercies and Judgments on Many Particular Persons’; the seventh, ‘Disturbances Given to the Churches of New England.’ In the sixth book, the author gives accounts of the wonders of the invisible world, of worthy people succored when in dire distress, of the sad ending of many wicked ones, and of the cases of witchcraft at Salem and other places.

Magnentius, măg-nĕn'shĭ-ŭs, **Flavius Popilius,** Roman imperial usurper of the West: d. August 353. Having been entrusted by Constans with a high military command he availed himself of his office to plot the emperor's overthrow. On 18 Jan. 350, presenting himself in imperial purple at a great banquet given by one of the conspirators at Autun, he was saluted with the title of Augustus; and assassins sent for the purpose having despatched Constans, Magnentius was acknowledged as emperor by all the western provinces except Illyria. Constantius, on hearing of his brother's murder, hastened from the confines of Persia and defeated Magnentius (351). These disasters led to the defection of all the countries that had recognized the usurper, who thereupon committed suicide.

Magne'sia, the oxid of magnesium, MgO. See MAGNESIUM.

Magne'sian Limestone, a rock consisting of the mixed carbonates of lime and magnesia. Mineralogically it is known as DOLOMITE (q.v.).

Mag'nesite, a white, porcelain-like mineral (magnesium carbonate, $MgCO_3$,; carbon dioxide 52.4 per cent, magnesium oxide 47.6 per cent), usually found associated with serpenpentine, talcose slates, and dolomite. The magnesite of commerce comes from several localities; notably, Veitsch in Styria, Austria, where it occurs in conformable beds in a Silurian formation; at Frankenstein in Silesia, where a very pure variety is found; at Bolton, Canada, there is a ledge 60 feet wide which is tinged with green by chromium. The quality, however, is not good. In the Red Mountain mining district, Santa Clara and Stanislaus counties, Cal., is found the largest known deposit in the world. Here there are several ledges from 20 to 60 feet wide and of very pure quality. It is also found in Napa, Sonoma, Fresno, Placer, Mariposa, Monterey, and San Luis Obispo counties, Cal. Magnesite is used as a bleaching agent in papermaking, and for making an excellent artificial stone for interior decoration. Its chief use, however, is in the manufacture of firebrick. In brick-making it is calcined, the gas CO_2 being collected and sold for charging mineral water and for use in cold-storage plants, instead of ammonia, and the resulting magnesium oxide mixed with a binding material and pressed into brick. From the pure mineral metallic magnesium and salts, as Epsom salts and magnesium chloride, are manufactured.

O. H. PACKER.

Magne'sium, a metallic element whose compounds are abundant and widely distributed, but which does not occur, in nature, in the metallic form. Magnesium resembles calcium in its chemical deportment, and the oxids of the two metals were long confused with each other. Metallic magnesium was first prepared by Davy, in 1808, both by electrolysis, and by the reduction of white-hot magnesia in an atmosphere of potassium vapor. In 1830 Bussy obtained a larger and purer yield of the metal, by heating a mixture of potassium and anhydrous magnesium chloride to redness. It is best prepared by the electrolysis of the fused anhydrous chloride, or of a mixture of magnesium chloride with the chlorides of sodium, potassium, and ammonium. Pure magnesium is silvery-white in color, lustrous, and moderately hard. It may be hammered, rolled, filed, and polished. Its specific gravity is about 1.70, and its specific heat about 0.245. Its melting point is variously given, the estimates ranging from 850° F. to nearly 1,500° F. When raised to a bright-red heat (out of contact with the air) it volatilizes, depositing upon cool surfaces again in the form of lustrous silvery crystals which belong to the hexagonal system, and are isomorphous with those of zinc. It expands by 0.000015 of its own length, per Fahrenheit degree of rise of temperature; and at 32° F. its electrical resistance is 0.0438 of that of mercury.

Chemically, magnesium is a dyad. It has the symbol Mg, and an atomic weight of 24.36 if $O=16$, or 24.18 if $H=1$. Its most important compounds are the oxid, MgO, the chloride, $MgCl_2$, the sulphate, $MgSO_4$, and the carbonate, $MgCO_3$. Metallic magnesium is not altered upon exposure to dry air, but ordinary air oxidizes it superficially. It dissolves readily in dilute acids, with the formation of the corresponding salts. Chlorine, bromine, iodine, fluorine, sulphur, phosphorus and arsenic combine with it directly. Red-hot metallic magnesium also slowly combines with free nitrogen to form a solid nitride. In the isolation of argon, helium, and the other rare gases of the atmosphere, advantage is taken of this fact for separating these gases from the nitrogen of the air. (See ARGON.) When strongly heated in the air, metallic magnesium takes fire and burns with an exceedingly brilliant white light that is rich in chemical rays; the product of the combustion being magnesia, MgO. Advantage is taken of this property in photography, most of the «flash-light» powders that are used consisting essentially of pulverized magnesium, either alone, or mixed with a small quantity of some explosive or oxidizing agent. Magnesium will also burn when sufficiently heated in steam, carbon dioxid, or sulphur dioxid.

Magnesium oxid, or «magnesia,» MgO, is usually prepared by heating the nitrate or carbonate of the metal; and on account of this method of preparation it is commonly known as «calcined magnesia.» Magnesia is a white substance, without taste or odor. It does not have a strongly alkaline reaction, but it acts as a powerful base, reacting with acids to form the magnesium salts. It is scarcely soluble in water, but it slowly absorbs moisture and carbon cated in Fig. 2 it will be observed to take up a position somewhat as indicated in the lower part of this diagram, as its point of suspension is moved along the line. The region where this directive force is noticeable is called the *field* of the magnet. (Gilbert's "orb of virtue.") If continuous lines are drawn, which at each point have the direction taken by the free magnet,

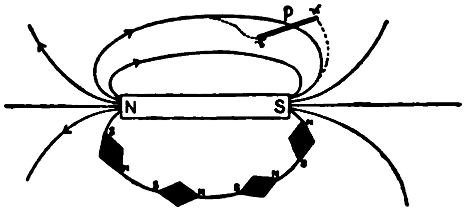

Fig. 2.

these lines are called lines of magnetic force, and they offer a very convenient method for a general study of magnetic action. While these lines have no objective existence, it is, nevertheless, desirable to imagine that they are real and that they possess certain definite qualities. They should always be considered as being directed away from the north-seeking or positive pole. In the early conception of magnetic action these lines would have been regarded as the lines of flow of the magnetic material, and the word flux, still in use, bears evidence of this conception. It is convenient also to regard the lines of force as being under tension and capable of repelling each other. The number of actual lines of force which could be drawn about a magnet is infinite. For purposes of comparison, however, it is customary to represent the force action at a point upon the unit pole placed at that point by the number of lines drawn per square centimetre on a surface perpendicular to the field. A unit field is one in which a force action upon a unit pole is one dyne, about the weight of 1–1000 of a gramme.

In order to compare magnets and to facilitate magnetic computations, certain methods of measurement have been devised. Only a brief sketch can be given here, as full details of these operations may be found in books devoted to this subject, some of which will be mentioned at the end of this article. When a bar magnet is placed at right angles to the lines of a uniform magnetic field it will experience a twist tending to place it along these lines. The amount of this twist will depend upon three things. First: The pole strength of the magnet in question. Second: The distance between the poles. Third: The strength of the field where it is placed. The product of the pole strength by distance between poles is called the magnetic moment of the magnet. When a magnet is suspended freely and slightly displaced from a position parallel to the lines of force it will vibrate about this position. The time required for a complete swing is found to depend upon the magnetic moment, the moment of inertia, and the strength of the field where the magnet is placed. The vibration period may be directly observed and the moment of inertia computed from the dimensions and weight of the magnet. In this way the product of the magnetic moment by the field strength may be found. If the same magnet is held with the line joining its poles east and west it will cause a small freely suspended magnet some distance to the east or west to turn slightly from its equilibrium position. The amount of this deflection depends on the distance between the magnets and the ratio of *magnetic moment* to *field strength.* If we denote the magnetic moment by *ml* and the field strength by *H*, the product of *ml* times *H* is found from time of vibration, and by means of the deflection of the small auxiliary magnet *ml-H* may be determined. When *ml* times *H* or *ml* divided by *H* is known either *ml* or *H* is readily computed. When the field at any point is known, a comparison of the time of vibration of a magnet at the known point with its period when vibrating at any other point enables us to compare the two fields without further measurement. The law of change being that if periodic time is doubled the field strength would be four times as great; or the period varies inversely as the square root of the field in which the magnet vibrates.

The facts mentioned above regarding the ability of a magnet to cause pieces of neutral iron or steel to show magnetic properties is frequently spoken of as magnetic induction. The general phenomena can be readily remembered if we imagine that it is easier for lines of magnetic force to pass through iron than through air. Small pieces, as shown at P, Fig. 2, would have lines entering at "S" and leaving at "N" and would behave as small magnets placed in corresponding positions. Owing to the tension of the lines of force these small pieces would tend to set themselves nearly parallel to the undisturbed direction of the lines. If a sheet of glass or other non-magnetic material is placed over a magnet and iron filings are sprinkled on its surface, a slight tapping, sufficient to overcome friction, will enable the lines of force to arrange the small temporary magnets parallel to the field. In this way maps of magnetic fields may be readily found, and their study throws considerable light upon many details of these peculiar phenomena. Such fields are shown in Figs. 3 and 4. If a sphere of iron or cobalt is free to move in a magnetic field which is not uniform, a tendency is always ob-

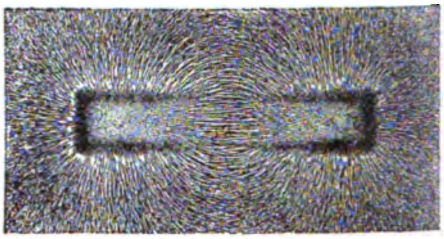

Fig. 3.

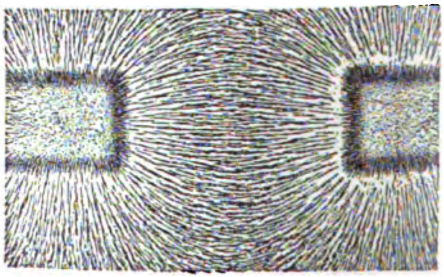

Fig. 4.

each piece possesses a plus and a minus pole practically identical with the poles of the original needle. Carry this process to any length and each little piece, however small, will be found to possess two poles, one positive and the other negative. If we assume that this process could be carried on to the smallest conceivable particle of the iron we should say that each molecule of the iron is by itself a magnet. We may further suppose that the molecular magnets in a neutral piece of iron are entirely devoid of regular arrangement as regards position of the poles; such a chaotic condition may be indicated roughly by Fig. 7. It may be supposed that these molecular magnets are partly held in position by the action of forces analogous to friction, which also tend to hold them in any new position to a greater or less extent in case the original arrangement is disturbed. Under the action of a weak magnetic field these friction forces would prevent the turning of the molecular magnets into parallelism with the field lines. As soon as the field is strong enough to overcome this sort of friction we might expect the same tendency to arrangement of these minute magnets that is observed in the case of iron filings in the mapping of magnetic fields. As long as a considerable number of the axes of these molecular magnets make fairly large angles with the field lines the leverage by which turning is produced would be considerable; if however they approach parallelism with each other and the field lines, the effective twisting would be very materially reduced. This would correspond to the approximate saturation of the iron and no considerable change in position could be produced by increasing the field strength. The general arrangement may be indicated approximately in Fig. 8, where it will be observed that there is a tendency for free positive poles to appear at one end, namely where the field lines leave the iron and for uncompensated negative poles to appear at the other end.

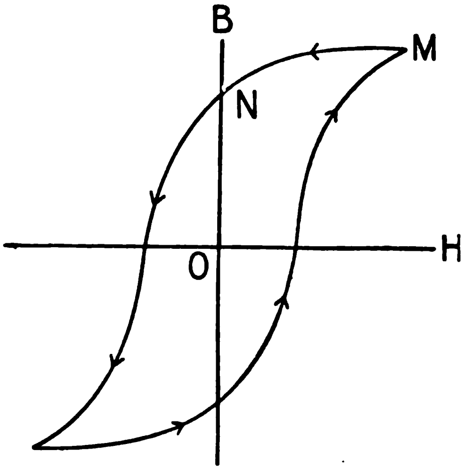

FIG. 6.

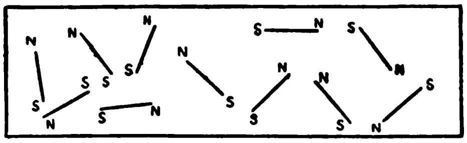

FIG. 7.

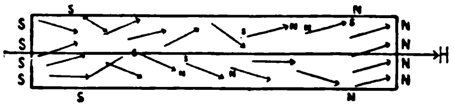

FIG. 8.

The facts in favor of this sort of explanation may perhaps be briefly summarized as follows: (1) The general shape of the magnetic curve is explained. (2) As friction or other molecular forces tend to prevent a return to the original chaotic condition after magnetization this arrangement would in part persist after removal from the field, or permanent magnetism would be explained. (3) Soft iron should be easier to magnetize and less permanent than hardened iron or steel. (4) Jarring as by blows tends to reduce friction and to assist in the process of magnetization and also to reduce permanent magnetism. (5) High molecular activity consequent on rise of temperature decreases magnetic action, in fact, at a dull red heat iron is non-magnetic. (6) Rapid reversals of magnetism involves work against molecular forces and the production of heat, this heat is proportional to the area of the loop. (7) A tube of iron filings or a set of pivoted magnets shows the same behavior in a rising or falling magnetic field as a solid bar. The precise agreement between experimental facts and the indications from theory shown above makes this conception extremely useful. Just why molecules of iron should be permanently endowed with magnetic properties is a subject for speculation which has been indulged in by numerous prominent scientists. It has been supposed for example that electrical currents flow around these molecules, that they consist of vortex rings or that small electrically charged parts are in vibration in such a way as to produce the phenomena of permanent molecular magnetism. The general usefulness of the hypothesis is in no way connected with the truth or falsity of such speculations any more than the facts regarding free fall are dependent on our view of gravitation.

The general statements noted above regarding magnetism of iron are of importance in the manufacture and utilization of magnets for various purposes. Where a considerable amount of permanent magnetism is undesirable, soft iron or steel is always used. For the manufacture of permanent magnets special steel is selected and hardened and is then magnetized by its insertion into a solenoid carrying a powerful electric current. Severe shocks or blows are frequently given in order to assist in the molecular rearrangement. The interaction of all the elementary magnets together with temperature changes and mechanical shocks will tend to weaken a magnet. This loss is very considerable at first but finally an almost permanent state is reached. When used in electrical measuring instruments magnets are artificially aged by subjecting them to considerable changes of temperature and a series of mechanical shocks. It should be noted in this connection that the permanence of the magnet will be somewhat increased by joining its poles, when not in use, The contrast between the state of knowledge regarding magnetism before 1600 and its present development is one of the most striking indications of the growth of scientific investigation. Instead of vague speculations, partial truths veiled in mysticism, more or less direct references to dogma and the supernatural, we have organized knowledge based on experience and constantly checked by experiment and application. The number of those who believe in «magnetic» healing or, that, because an iron pipe driven in the earth shows polarity, the water flowing through it is magnetic and has special medicinal virtues, is constantly on the decrease. The relations between magnetism and other fields of physical research can not be treated in this article, yet it may be well to mention that such relations are constantly being investigated and no one in touch with present developments believes that the end is at hand. And it may well be that the delicately poised magnetic needle in some future interpretation of its countless movements will give us a knowledge of the invisible yet all-pervading agency which governs its fluctuations and lead us to a broader generalization of physical phenomena than we can formulate at present.

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Magnetism, Animal. See ANIMAL MAGNETISM.

Magnetite, or **Magnetic Iron Ore,** native magnetic oxid of iron, Fe_3O_4. It sometimes has part of its iron replaced by titanium or magnesium, and occasionally by nickel. It is very abundant (the production of the United States in 1901 being 1,813,076 tons), and when pure it constitutes a valuable ore of iron, 72 per cent of its weight consisting of that metal. Magnetite crystallizes in the isometric system, commonly in octahedra, but also in dodecahedra, with striated faces. It also occurs, and very generally, in massive and granular forms. It is black in color, with a metallic or submetallic lustre. It is brittle, and has a hardness of from 5.5 to 6.5; the crystals having a specific gravity of about 5.17. It may be readily distinguished by the fact that it is strongly magnetic. Specimens are found which manifest quite a strong, permanent magnetic polarity, this variety of the mineral being known as «lodestone.» Magnetite occurs in vast beds in Canada, and in the northern and eastern parts of the United States. Abundant deposits of it are also known in California and Washington.

Mag″neto-elec′tric Machines. See ELECTRO-MAGNETIC MACHINE; ELECTROTHERAPEUTICS.

Mag″neto-elec′tricity. See ELECTRO-MAGNETISM; ELECTRO-MAGNETS.

Magnetom′eter, an instrument employed in observatories to measure the intensity of terrestrial magnetism. A magnet may be allowed to move freely in a horizontal plane by being supported on a fine vertical pivot, or by suspension on a fine untwisted silk thread. Bifilar suspension is more to be depended upon; the magnet is supported by two parallel threads; screws enable the tensions in the threads to be equalized and their distance asunder to be adjusted. See MAGNETISM (*Terrestrial*).

Magnif′icat. The words which Mary pronounced when she visited Elizabeth (Luke i. 46–55) begin, *Magnificat anima mea dominum* («My soul doth magnify the Lord»). Hence the whole of her thanksgiving on this occasion has been called the Magnificat. The present usage of the Roman Catholic Church is to chant or pronounce the Magnificat every day at vespers.

Magno′lia, Ark., town, county-seat of Columbia County; on the Louisiana & N. and the St. Louis S. R.R.'s; about 138 miles southwest of Little Rock. It is in an agricultural and lumbering region. Considerable cotton and fruit are raised in the vicinity. It has a large trade in lumber, fruit, and cotton. Its chief buildings are the county buildings, the schools, and churches. Pop. (1900) 1,614.

Magnolia, a genus of ornamental, deciduous or evergreen trees and shrubs of the order *Magnoliaceæ*. The 20 species are natives mostly of the United States, India, China, and Japan. They are characterized by large, alternate entire leaves, large white, purple or pink, sometimes yellowish, solitary, terminal flowers, which are often highly fragrant; and cone-shaped, often red, decorative fruits. They are widely planted for ornament in parks and gardens; most of the deciduous species being tolerably hardy as far north as Massachusetts, some even farther north, but the evergreen kinds tender even at Washington, where, however, one species (*M. grandiflora*), can withstand the winters if in protected situations. The wood is close-grained, generally soft, spongy, light and satiny. It is little used because it is not durable, but in Japan one species (*M. hypoleuca*), is used for lacquering. The bark and the fruits of a few species were formerly employed as stimulants and tonics, but have fallen into disuse.

As a rule, magnolias thrive best in rather rich, fairly open, moist, peaty or sandy loams, but generally prove satisfactory upon any garden soil. A few, especially the beaver tree (*M. glauca*), which is also popularly known as sweet, swamp, or white bay, are natives of very wet grounds and must be naturally well supplied with water, when planted for ornament. They may be propagated by means of layers, by grafts, or by seeds planted as soon as ripe or stratified in sand and kept out of doors where they can not become dry. The plants should be transplanted when the new growth is commencing, otherwise the operation is frequently unsuccessful.

The following species are among the most generally planted in the United States. The bull bay or big laurel (*M. grandiflora*) is found naturally from North Carolina to the Gulf States. It is a pyramidal, evergreen tree which often attains heights of 75 feet or more, and is especially conspicuous when in blossom, its fragrant white flowers often attaining a diameter of a foot. The swamp sassafras or sweet bay (*M. glauca*) ranges from the coast region of Massachusetts to Florida and irregularly southwestward to Texas. It reaches a height of 20 feet and bears fragrant cream-colored flowers. The cucumber trees (q.v.) are natives of the southeastern United States and are particularly attractive because of their pink fruits. The flowers of the first are often eight inches in diameter, and conspicuously colored; those of the latter are much smaller and greenish yellow, or green. Of the exotic species the yulan (*M. yulan*), a native of China, where it has been cultivated for more than a thousand years, and *M. pumila*, *M. obovata*, and *M. hypoleuca* are popular, the first and last particularly. By crossing, hybridizing and selection a large number of choice horticultural varieties have been produced.

Magoffin, mạ-gŏf'ĭn, **Beriah**, American statesman: b. Harrodsburg, Ky., 18 April 1815; d. there 28 Feb. 1885. He was graduated from Centre College (Danville, Ky.,) in 1835, from the law school of Transylvania University (Lexington, Ky.) in 1838, entered the practice of law at Jackson, Miss., in 1839, but in the same year returned to Harrodsburg. In 1840 he became police judge, in 1848, 1856, and 1860 was a delegate to the Democratic national conventions, in 1850 was elected to the State senate of Kentucky, and in 1859-62 was governor of Kentucky. He refused, 15 April 1861, to comply with Lincoln's call for 75,000 troops; in May 1861 by proclamation warned both the Confederate and Federal governments against occupying Kentucky soil, and the citizens of the State against entering hostilities; and in August requested Lincoln to withdraw United States troops. He vetoed a resolution of the legislature directing him to proclaim the evacuation of Kentucky by the Confederates; but the resolution was passed over his veto. In August 1862 he resigned his office, and in 1867 was elected to the lower house of the State legislature.

Magog, mā'gŏg, Canada, town in Stanstead County in the province of Quebec; on Lake Memphremagog at its outlet, and on the Canadian Pacific; about 19 miles southwest of Sherbrooke. It has regular daily communications with Newport and other places in Vermont. Magog is a favorite resort for anglers. Pop. (1891) 2,100; (1901) 3,516.

Magog. See Gog and Magog.

Mag'ot. See Barbary Ape; Macaque.

Mag'pie (originally *pie*, the pied or variegated bird), a bird of the genus *Pica*, closely related to the jays. The genus is distinguished by the extremely long wedge-shaped tail, the middle feathers of which equal the entire length of the head and body, while the outer feathers are less than half as long. The notorious magpie of Europe (*P. rustica*) is represented in North America by the variety *hudsonica*, which is rather larger but otherwise similar. The color is a lustrous black with a varied and changing iridescence and sharply contrasting white under parts and patches on the shoulders and wings, the latter being conspicuous as the bird flies. The yellow-billed magpie (*P. nuttalli*) of California, is precisely similar except that the bill and a naked area at its base are yellow instead of black. Other species inhabit Asia and Africa. In America the common magpie is confined to the west, its range reaching from Alaska to Arizona and from the plains to the Cascade Mountains, being especially common in the Rocky Mountains. The magpie is a handsome bird of saucy, vivacious habits and is chiefly noted for its thieving habits and general rascality. It is always engaged in mischief, either in stealing brightly colored or glittering objects from the habitations of man or in robbing the nests of other birds, but because of its pert, merry manner is usually forgiven for the former class of offenses. The caged birds seen in the east give but a faint idea of the beauty and activity of these birds in the wild state. Like the jays the magpies are omnivorous, but are less strictly arboreal than they. The nest, which is built in a tree or bush, is very ingeniously and substantially constructed. It is a large domed structure protected outwardly by a thick, bristling layer of thorns and twigs, through which a narrow passage opening on one side leads to a deep cup plastered with mud and lined with fibres. Six to nine greenish drab eggs, much spotted and dashed with various shades of brown, are laid. The American magpie is occasionally taken young and made a pet, but it has not the reputation for talking and amusing, albeit thievish, manners which has made the European bird a favorite from ancient times. Descriptions of its many interesting habits will be found in the books of Coues, Ridgway, Merriam, Cooper, Keyser, and other writers upon the ornithology of the western United States.

Magrath', **William**, American painter: b. Cork, Ireland, 20 March 1838. He emigrated to the United States in 1855, and was elected National Academician in 1876. He has produced many excellent landscapes and his genre pictures are full of character. Among them may be mentioned 'The Road to Kenmair' (1871); 'The Reveillé' (1873); 'Rustic Courtship' (1877); 'On the Old Sod' (1879), which last is in the New York Metropolitan Museum.

Magruder, mạ-groo'dėr, **John Bankhead**, American soldier: b. Winchester, Va., 15 Aug. 1810; d. Houston, Texas, 19 Feb. 1871. He was graduated at West Point in 1830, served for a short time in the 7th infantry, then in the artillery. In 1836 he was made first lieutenant, saw service in the Seminole war 1837-8, and became captain in 1846. He took an active part in the Mexican War, rising to the rank of lieutenant-colonel. In 1861, while in garrison at Washington, D. C., he resigned from the United States army, accepted a Confederate colonelcy, and commanded the artillery at Richmond. In the same year he won the battle of Big Bethel (q.v.), and was made brigadier-general and major-general. Assigned to the Yorktown district, he fortified the Peninsula, and with a force of 12,000 held it against the Army of the Potomac in April 1862. In the Seven Days' Battles (q.v.) he commanded the Confederate left. In October 1862 he was appointed commander of the Department of Texas. He recaptured Galveston 1 Jan. 1863, and broke the blockade of that port. After the War he served as major-general in the army of Maximilian in Mexico until the end of the empire, then settled at Houston for the rest of his life.

Magruder, Julia, American novelist: b. Charlottesville, Va., 14 Sept. 1854. Her education was conducted privately, and her literary career began in 1885 with 'Across the Chasm,' published anonymously. She has written: 'A Magnificent Plebeian'; 'The Violet'; 'Miss Ayr of Virginia'; 'A Manifest Destiny'; 'Princess Sonia' (1895); etc.

Maguey, mạ-gwā'. See FIBRE.

Maguindanao, mā-gēn-dä'now, a tribe of Moros who inhabit the valley of the Rio Palangui, island of Mindanao; the Moros of the Sarangani Islands, and some of those of Davao Bay belong also to this group. See PHILIPPINE ISLANDS.

Magyars, mŏ'györz, the original name of the Hungarians, which they still use in preference to any other. See HUNGARY.

Mahâ-bhârata, mä-hä-bhä'ra̤-ta̤, **The,** the greatest epic of the literature of ancient India. The name signifies 'The Great (Poem) of the Bhâratas.' The work is perhaps less truly an epic poem in a strict sense than a collection of epic material; there being a central narrative, but the constituent parts being assembled about it in rather a heterogeneous fashion; and many portions admitting of detachment without the slightest effect upon the poem. The composite authorship of the 'Mahâ-bhârata' is indicated by the native ascription of it to Vyâsa, a generic title meaning an «arranger» or «distributer.» In its present state the epos consists of upward of 100,000 couplets of 32 syllables each; and is therefore about eight times more extensive than the combined 'Iliad' and 'Odyssey.' It is subdivided into 18 parvans, or books, with an appendix or supplementary portion called the 'Haravança.' Evidence exists to its currency under its present title as early as 350 B.C., but whether it was then in its present condition has not certainly been determined. Its origin is extremely remote. The main story of the poem concerns the feud between the Kauravas and Pándavas, rival branches of the royal line of Hastinâpura (Delhi), among whose ancestors was the King Bhârata from whom India is sometimes called «The country of the Bhâratas» (Bhârata-varsha). The Pándavas are represented as goodness and heroism personified; the Kauravas generally as inconceivable villains. A final war results in the complete victory of the Pándavas. The episodical material which thickly overlays the central theme assumed an encyclopædic character; and the study of the 'Mâha-bhârata' became as much an education for the Hindu as that of the 'Iliad' and 'Odyssey' once was for the Greek. Much of the 'Mâha-bhârata' must to the general reader appear grotesque or even absurd. But, even so, it will continue remarkable for its vast scope, its lofty teachings, and the literary merit of many parts. The so-called *editio princeps* of the text is that of 1834-9 (Calcutta). There is also an edition of 1890. A rendering into English was begun by Protap Chunder Roy in 1883 and has been contributed to by other Hindus. Translations from it have also been made by H. H. Milman ('Nala' 1860) and Sir Edwin Arnold ('Indian Idylls' 1883). Consult: Monier-Williams, 'Indian Epic Poetry' (1863); Wheeler, 'The Vedic Period of the Mahâ-bhârata' (1867); Goldstücker, 'Literary Remains,' Vol. II. (1879); Wheeler, 'Short History of India' (1884). See SANSKRIT LITERATURE.

Mahadeva, ma̤-hä-dā'va̤, in Hindu mythology, a deity who shares the attributes of Siva in the Indian Trinity, Mahadeva being regarded as a generator as well as a destroyer.

Mahaffy, ma̤-hăf'ĭ, **John Pentland,** Irish Greek scholar: b. Chapponaire, near Vevay, Lake Geneva, Switzerland, 26 Feb. 1839. He was educated in Germany and at Trinity College, Dublin, from which he was graduated in 1859; was appointed to a competitive fellowship in 1864; and became professor of ancient history in the college in 1871. In 1873 he was Donnellan lecturer. His first publication was a translation of Kuno Fischer's 'Commentary on Kant' (1866); and on philosophical subjects he has since issued 'Kant's Critical Philosophy for English Readers' (with J. H. Bernard 1872; new ed. 1889), containing a translation of the 'Prolegomena' and a defense of the critical philosophy; and a volume on 'Descartes' (1880) in Blackwood's 'Philosophical Classics.' The greater number of his works, however, treat of the history, literature, and everyday life of ancient Greece, among these being the following: 'Prolegomena to Ancient History' (1871); 'Greek Social Life from Homer to Menander' (1874); 'Greek Antiquities' (1876), a work much used in Continental schools; 'Rambles and Studies in Greece,' a record of antiquarian research (1876); 'Old Greek Education' (1879); 'History of Classical Greek Literature' (1880; 3d ed. 1891); 'Greek Life and Thought from Alexander to the Roman Conquest' (1887), a continuation of the work of 1874; 'The Greek World under Roman Sway' (1890), a continuation of the preceding; 'The Story of Alexander's Empire' (1890); 'Greek Pictures' (1890); and 'Problems in Greek History' (1892); 'The Progress of Hellenism in Alexander's Empire' (1905). He edited the English *translation* of Victor Duruy's 'Roman History' (*1883-6*); and has given some attention to *Egyptian history*, especially in the Greek period, the fruits of his studies in this field being his edition of the 'Flinders-Petrie Papyri' for the Royal Irish Academy (1891-3), and a work on the Empire of the Ptolemies (1896). He writes with particular interest and authority of the post-Alexandrian period of Greek life; and is continually discovering interesting parallels between that and modern civilization. What he may have sacrificed in pure scholarship he has gained in the vividness of his historical presentation. Among his other writings are: 'Twelve Lectures on Primitive Civilization' (1868); 'Report on the Irish Grammar Schools' (1880-1); 'The Decay of Modern Preaching' (1882); and 'The Art of Conversation' (1889).

Ma'haleb, a species of European cherry-tree (*Cerasus Mahaleb*), whose fruit affords a violet dye and a fermented liquor. Its flowers and leaves are used by perfumers, and its wood by cabinet-makers. See CHERRY.

Mahan, ma̤-hăn', **Alfred Thayer,** American naval officer: b. West Point, N. Y., 27 Sept. 1840. He was graduated from the United States Naval Academy in 1859, and served during the Civil War, rising to the rank of lieutenant-commander in 1865. In 1885 he was promoted captain, and in 1886 was appointed president of the Naval War College at Newport, a position which he held till 1888, and again from 1892–3. In 1893–5 he was commander of the Chicago, and in 1896 was retired from active service at his own request. In 1898 during the war with Spain he was a member of the Naval Board of Strategy; and in 1899 one of the United States delegates to The Hague Peace Conference. In 1890 he published his chief work, 'Influence of Sea Power upon History'; the continuation, 'Influence of Sea Power upon the French Revolution and Empire' appeared in 1892; his other writings include: 'The Gulf and Inland Waters' (1883); 'Life of Admiral Farragut' (1892); 'Life of Nelson' (1897), highly commended by English critics; 'The Interest of the United States in Sea Power' (1897), a compilation of his magazine articles; 'Lessons of the Spanish War' (1899); 'The Problem of Asia' (1900); 'The South African War' (1900); 'Types of Naval Officers' (1901); 'Retrospect and Prospect' (1902). His 'War of 1812' appeared in 'Scribner's' in 1904.

As a historian he has made a distinct contribution to historical science as the first writer to demonstrate the determining force which maritime strength has exercised upon the fortunes of individual nations, and consequently upon the course of general history. Technically, his representative work, the 'Influence of Sea Power upon History,' is but a naval history of Europe from the restoration of the Stuarts to the end of the American Revolution. But the freedom with which it digresses on general questions of naval policy and strategy, the attention it pays to the relation of cause and effect between maritime events and international politics, and the author's literary method of treatment, place this work outside the class of strictly professional writings and make it a recognized leading authority. His prime object, in establishing the thesis that maritime strength is a determining factor in the prosperity of nations, was to reinforce his argument that the future interests of the United States require a departure from the traditional American policy of neglect of naval-military affairs. Captain Mahan was president of the American Historical Association in 1902–3; and has received honorary degrees from several universities, including Oxford and Cambridge, England.

Mahan, Asa, American Congregational clergyman and educator: b. Vernon, N. Y., 9 Nov. 1800; d. Eastbourne, Sussex, England, 4 April 1889. He was educated at Hamilton College, Clinton, N. Y., and Andover Theological Seminary, and after holding pastorates at Pittsford, N. Y., and Cincinnati, Ohio, was president of Oberlin College 1838–50; and also professor of philosophy there. He was president of Cleveland University 1850–6; and of Adrian College, Mich., 1860–71. After the last named date he lived mainly in England. Among his works were: 'Doctrine of Christian Perfection' (1839); 'System of Intellectual Philosophy' (1845); 'The Will' (1846); 'Science of Logic' (1857); 'Mental Philosophy' (1882); 'History of Philosophy' (1883).

Mahan, Dennis Hart, American military engineer: b. New York city 2 April 1802; d. near Stony Point, N. Y., 16 Sept. 1871. He was graduated at West Point in 1824, where in 1825 he was appointed assistant professor of mathematics and of engineering. He was stationed in Europe four years on professional duty and in 1832 returned to West Point as professor of military engineering, where he remained until his suicide, which was caused by temporary insanity. His text-books are generally recognized authorities and include: 'Treatise on Field Fortifications' (1836); 'Descriptive Geometry' (1864); 'Military Engineering' (1865); 'Permanent Fortifications' (1867); 'Military Course of Civil Engineering' (1837, rewritten 1868); etc.

Mahanadi, mä-hä-nŭd'ĭ, or **Mahanuddy,** a river in British India. In the upper part of its course it drains the fertile plain of Chattisgarh in the Central Provinces; flows southeast and then east through the province of Orissa, past Sambalpur and Cuttack, into the Bay of Bengal by two mouths, after a course of about 530 miles. During the rains it is navigable 300 miles from its estuary, but a large portion of its channel is dry during five or six months of the year. An extensive system of irrigation canals is connected with it. Diamonds are found in this river and in several of its tributaries.

Mahanoy (mä-hạ-noi') **City,** Pa., borough, in Schuylkill County; on Mahanoy Creek, and on the Lehigh Valley and the Philadelphia & Reading R.R.'s; about 55 miles northeast of Harrisburg. The first settlement was made in 1859, and it was incorporated in 1863. It is in the anthracite region, and in the vicinity is fire-clay and an excellent building-stone. Its chief manufactures are pottery, foundry products, flour, hosiery, and lumber. In the vicinity are about 20 collieries, all of which are operated by residents of Mahanoy City. The trade is principally in coal, pottery, and lumber. The city has excellent public and parish schools and a number of fine churches. Pop. (1900) 13,504.

Maharajah, mạ-hä-rä'jạ, a title used in India; applied in courtesy to every rajah, or to any person of high rank or deemed holy.

Mahaseer, mä'hạ-sēr, a large and ravenous barbel (*Barbustor*) of India, which reaches six feet in length and in the early part of the rainy season afford the best sport known to the anglers of India and Ceylon, as they take a fly readily, and struggle with the gameness and energy of a salmon to get free, pleasantly taxing the skill of the angler to bring them to land without breaking rod and line. They spawn at the heads of the hill-rivers, and then descend before the young are hatched. The fry then have an opportunity to grow in comparative safety to a size which enables them, the following season, to descend the rivers and take care of themselves; otherwise they would be devoured in infancy by their elders.

Mahat'ma, a Hindu word meaning «the great-souled one,» and applied among the Brahmans to one who has attained the highest possible point of spiritual enlightenment. It is also the name of a high priest or «wise leader» of the theosophists (q.v.).

Mahâyâna, a term applied to the «Northern School» of Buddhism which some centuries after the death of Buddha (q.v.) had spread and become the dominant system in northern India, including Kashmir and Nepal. Mahâyâna is a Sanskrit term meaning «Large Vehicle,» so called because it is averred to be a system which affords salvation to a larger number of persons than are reached by the «Southern School»— Hinâyâna, the «Little Vehicle.» Mahâyâna corresponds with the Lamaism (q.v.) of Tibet and Mongolia. The Hinduistic and Shamanistic notions of the northern barbarians have been absorbed by it and the gods and rites that belong to Shivaism (q.v.) have become adopted so as to alterate the purity of original Buddhism. A thousand new Buddhas appear in its doctrines, among whom is Adi-Buddha, who at Nepal assumed the prerogatives and demanded the worship belonging only to the Supreme Being. In certain Japanese sects so far has «The Great Vehicle» diverged from true Buddhism that priests are allowed to marry.

Mahdi, mä'dē. See Mad Mullah.

Mahé, mä-hā', Indian Ocean, the largest island of the Seychelles Archipelago, belonging to Great Britain. It is 17 miles long by 4 miles broad, has an area of 55½ square miles, and attains an elevation of 2,000 feet above sea-level, from which it rises in most places nearly perpendicularly. It contains Victoria, the administrative seat, and a coaling station with a good harbor. See Seychelles.

Mahhol. See Machol.

Mahi Kantha (mä'hē kän'tha) **Agency,** India, a group of 39 native Gujerat states, administered since 1820 by a British political agent of the province of Bombay. The chief state Idar, occupies about one half of the combined area of 9,300 square miles. Pop. (1900) 361,508, consisting largely of wild Bhil and Khoil tribesmen.

Mahican, mä-hĭk'an (meaning «wolf»), an Algonquin tribe of American Indians formerly occupying the Hudson River Valley. They were closely related to the Delawares and the Mohegans, the collective tribes being known as the *Loup* or Wolf Indians. At one time there was a settlement of 40 villages near the site of the present city of Albany. The assaults of the Iroquois and the white settlers diminished the tribe until the remnants of the race became merged with the Delawares. About 550 of the tribe still remain, located upon a reservation near Green Bay, Wis.

Mahmud (mä-mood') **I.,** or **Mohammed,** Turkish sultan: b. Constantinople 1696; d. 1754. He was the son of Mustapha II. and succeeded his uncle Achmet III. He was a well-disposed but incapable monarch and his reign is of little importance.

Mahmud II., Turkish sultan: b. 20 July 1785; d. 1 July 1839. He was the second son of Abd-ul Hamid II., and under the reign of his uncle Selim III. he received an education exceptionally broad for a prince of his station. He succeeded his brother Mustapha in 1808 and organized his government on a reform basis. He conducted a war against Russia and Servia until 1812, subjected the Wahabees and quelled the insurrection of Ali Pasha in 1822. In his war with the Greeks he incurred the intervention of the powers with disastrous results to his forces. Mahmud was a progressive monarch, he introduced modern ideas of warfare, a regular police system, and founded schools. Against serious obstacles he crushed the janissaries, but a second rebellion of Mehemet Ali in 1839 was followed by a defeat which shortly preceded the broad-minded monarch's death.

Mahmud, sultan of Ghazni, the founder of the Mohammedan empire in India: b. Ghazni about 970; d. 29 April 1030. His father Sabaktagin, governor of Ghazni, owed a nominal allegiance to Persia, but was really independent. On his death Mahmud put aside his brother Ishmael, whom his father had appointed to succeed him, took the title of sultan, then overthrew the Persian monarchy, and laid the foundation of an extensive empire in Central Asia. He then turned his attention to India, which he invaded repeatedly. His earlier expeditions into the country were directed against successive rajahs of Lahore, on whom he inflicted repeated defeats. In 1008 the rajah of Lahore, Anangpal, with the assistance of a powerful coalition of rajahs, had assembled one of the largest armies yet seen in the Panjab, but Mahmud was again victorious, and carried away enormous spoils from the Temple of Nagarcot (1008). On his return he celebrated a triumph at Ghazni. In 1010, after subduing Ghor in the Hindu-Kush, he resumed his conquests in India, captured Multan, plundered the Temple of Tanesar, and continued for a series of years to extend his conquests in successive expeditions. These for a time were interrupted by his conquest of Transoxiana, effected in 1016. In 1017 he set out at the head of an army of 100,000 foot and 20,000 horse, passed the Jamna Jummd, and turning to the south appeared before Canoj, the largest and most magnificent Indian city of the day, the rajah of which took precedence of all the Indian rajahs. As the rajah of Canoj at once submitted it was spared from pillage, a fate to which Mattra, a famous religious city, was subjected without restraint for twenty days. In 1023 he annexed the territories of Jeipal II., who had revolted, and established for the first time a permanent Mohammedan garrison in Lahore. His last, which is usually called his 12th, expedition into India (1024–6) was directed against Gujerat. He took the capital and changed the government, but the chief attraction was Somnáth. The magnificence of its temple filled him with wonder, and the descriptions of it suggest images of the palace of Aladdin. Its lofty roof was supported by 56 pillars carved and glittering with precious stones. It was lighted by a lamp suspended from the centre by a gold chain. A huge idol, which Mahmud broke, was found hollow, and disclosed immense treasures in diamonds and precious stones. The pieces of the idol were sent to Mecca, Medina, and Ghazni. The remainder of his enterprises were confined to western Asia. Mahmud was avaricious, and loved to accumulate treasures from his warlike expeditions.

Mahog'any. A popular name for the timber of several unrelated trees, among which are various species of eucalyptus (q.v.), natives of Australia and members of the natural order *Myrtaceæ;* two species of Cercocarpus, of the order *Rosaceæ, C. parvifolius* being known as valley mahogany and *C. leidfolius* as mountain mahogany in the Rocky Mountain region where they are native and are mainly used for fuel. African mahogany (*Khya senegalensis*), East Indian mahogany (*Soymida febrifuga*) and *Cedrela toona,* an East Indian tree equally well known also as the toona, all belong to the natural order *Neliaceæ*, but are less important timber trees than the true mahogany (*Swietenia mahagoni*) of the same natural order. This species is a native of tropical America, occasional small specimens being found in extreme southern Florida. It was formerly abundant in the West Indies, reaching altitudes of 1,500 feet or more in Jamaica, but on account of the demand it is now scarce. Cuba and San Domingo formerly supplied the choicest; Honduras the low grades; now, practically all comes from Central America. The wood is generally some shade of brown, fine grained, easily polished and durable except under lateral strain. It is highly valued for furniture, musical instruments, interior house-finishing, etc., and is one of the most popular woods of the world. Formerly it was used for ship-building but now very little. The tree, which sometimes attains heights exceeding 100 feet, and diameters of six feet, has abruptly pinnate leaves with usually four pairs of leaflets, and small white or yellowish flowers in axillary or nearly terminal panicles. As an ornamental tree it is planted in southern Florida and southern California in rich soil. A few other related species of this genus are occasionally found in commerce.

Mahom′et. See MOHAMMED.

Mahon, mä-hōn′, or **Port Mahon** (ancient *Portus Magonis*), Spain, city and port; on the island of Minorca, of which it is the capital, at the head of a bay which forms one of the best harbors on the Mediterranean. Fishing, fish-curing, agriculture, and stock raising are the chief occupations. In the bay are several rocky islets, on one of which stands an arsenal, on a second a lazaretto, and on a third a naval hospital. The harbor is strongly fortified. The exports are brandy, wine, dried fruits, agricultural produce, etc.; and the imports, grain, wearing apparel, tobacco, sugar, coffee, cacao, leather, hats, and other manufactured goods. Its trade amounts to about $1,000,000 annually. Mahon was occupied by the English in 1708. It was taken from them, after a memorable siege, by the French under Marshal Richelieu on 28 June 1756. Admiral Byng was shot for failing to relieve it. It was restored to the English in 1763; and taken by the Spaniards in 1782. It was retaken in 1798, and finally given up to the French by the Treaty of Amiens in 1802. Pop. (1901) 18,123.

Mahone, mą-hōn′, **William,** American soldier and politician: b. in Southampton County, Va., 1 Dec. 1826; d. Washington, D. C., 8 Oct. 1895. He was graduated at the Virginia Military Institute in 1847, and became a civil engineer and railroad constructor. At the opening of the Civil War he entered the Confederate army; took part in the Peninsular and Rappahannock campaigns, and by bravery at Petersburg acquired the sobriquet «The Hero of the Crater.» (See PETERSBURG, OPERATIONS AROUND.) In 1864 he was made brigadier-general and major-general. The war over, he accepted the presidency of the Norfolk & Tennessee Railroad, and also became active in politics. He was the principal organizer (about 1878) and chiefly a leader of the Readjusters (q.v.), a faction of the Democratic party in Virginia which favored the forcible readjustment of the State debt on terms involving conditional or partial repudiation. Mainly by the supporters of this movement, he was elected in 1880 to the United States Senate, where, however, he acted with the Republicans, making the vote of the Senate a tie and disappointing the Democrats of their expected majority. By this and other acts of his senatorial career he lost favor with his constituents and was not re-elected.

Mahony, mäh′ō-nĭ, **Francis Sylvester,** «Father Prout,» Irish author: b. Cork 1804; d. Paris 1866. Educated at a Jesuit seminary at Amiens, he studied theology at Paris, was admitted into the Order of the Jesuits and taught for some time in a Jesuit college in Ireland, but for some irregularities was deprived of the position of a member of the order. He received clerical ordination and officiated for a short time at Cork and in London, but soon adopted the profession of literature. In 1834–6 he contributed the ‹Prout Papers› to ‹Fraser's Magazine,› published as the ‹Reliques of Father Prout› in 1836. In 1846 he became Roman correspondent to the *Daily News*, his letters being afterward republished as ‹Facts and Figures from Italy› (1847). In his later years he was Paris correspondent for the *Globe*. The ‹Reliques of Father Prout› in a revised and enlarged form were published in 1860, and ‹Final Reliques› in 1876. In 1881 Charles Kent published a collective edition with a memoir. He will be longest remembered by his poem ‹The Bells of Shandon.›

Mahrattas, mą-răt′az, a native Hindu race, supposed to be descendants of the Persians, and occupying a large tract of central and western India. They came into prominence about the middle of the 17th century, when the chief Sevaji extended his conquests in various directions, had himself crowned king in 1674, and established the Mahratta empire. After his death long minorities and the incompetency of the sovereigns caused the powers of the state to fall into the hands of the *Peishwa* or prime minister, who became the acknowledged head of a Mahratta confederacy. This confederacy held together till 1795, but subsequent wars and disturbances reduced the Peishwa to the position of a British dependent, and Scindia, Holkar, and the rajah of Berar were able to take the position of independent sovereigns. The confederacy came to a final end in 1818, and Scindia, Holkar, the Guicowar of Baroda, and the rajah of Kolapore became dependent princes under British protection. Though devout worshippers of Brahma, no distinction of caste exists among them.

Mai, Angelo, ăn′jā-lō mä′ē or mī, CARDINAL, Italian classical scholar: b. Schilpario, near Bergamo, Italy, 7 March 1782; d. Albano, 8 Sept. 1854. His abilities attracted the notice of Father Mozzi, a Jesuit, who instructed him in Latin, Greek and mathematics. On the establishment of a Jesuit college at Colorno, in the duchy of Parma, he accompanied Father Mozzi thither in 1799, and a few years afterward was made professor of Latin and Greek in the Jesuit college at Naples. He was transferred to Milan (1808), where he became an associate of the Ambrosian College, and one of the Curators of the Ambrosian Library. One special department to which he devoted himself was the examination of the palimpsests (q.v.) and through his industry in deciphering these, two volumes of fragments of Cicero's orations, of Lysimachus and of Isæus, a fragment of the 'Vidularia' (a lost comedy of Plautus), and a collection of the letters and other writings of Cornelius Fronto, the preceptor of Marcus Aurelius, were recovered and given to the world. In 1819 he was appointed chief keeper of the Vatican Library at Rome, and discovered beneath a manuscript of St. Augustine's 'Enarrationes in Psalmos' obliterated fragments of Cicero's treatise 'De Republica,' amounting to about a fourth of the original, which he published in 1822 with a critical commentary. A colossal work was then undertaken by Mai, the editing of the various unpublished manuscripts in the Vatican, sacred and profane. It comprises ten quarto volumes, under the title of 'Scriptorum Veterum Nova Collectio e Vaticanis Codicibus edita' (1828–38), and consists of numerous fragments, previously believed to be lost, of the ancient historians, such as Polybius, Diodorus Siculus, Dionysius of Halicarnassus, Dion Cassius, Appian, and others, besides the various writings of the fathers. In 1838 he was created a cardinal. A new collection, 'Spicilegium Romanum,' was published in ten volumes between 1839 and 1844, and a patristic series, called 'Nova Patrum Bibliotheca,' issued between 1845 and 1853, closed his list of publications.

Maia, mā'ya, in Greek mythology, the eldest daughter of Atlas and Pleione. She was placed with her six sisters among the stars, where they have the common name of *Pleiades.* The Romans also worshipped a Maia, who was also called *Majesta,* and was afterward identified with the daughter of Atlas. The Tusculans called their principal deity *Majus.* The month of May is said to have received its name from them.

Maid of Athens, immortalized by Lord Byron, was Theresa Macri, who 25 years after Byron's poem was written had lost her beauty, lived in a hovel in dire poverty and had reared a large family.

Maid Marian, a name given Matilda, daughter of Fitz-Walter, baron of Bayard and Dunmow. She eloped with Robert Fitz-Ooth, an outlaw, and lived with him in Sherwood Forest. It is supposed that she was married by Friar Tuck to Fitz-Ooth, who was more commonly called Robin Hood.

Maid of the Mist, (1) the name of a small steamboat formerly used on the Niagara River below the Falls, to carry passengers close to the cataract. (2) A name given to the heroine of Sir Walter Scott's 'Anne of Geierstein.'

Maid of Orleans, a name given Jeanne d'Arc (1412–31) (q.v.).

Maiden, or **The Widow,** an instrument of capital punishment used in Scotland during the 16th century, the prototype of the French guillotine (q.v.): It consisted of an upright frame and a broad piece of iron a foot or more wide, sharp on the lower part, and loaded above with lead. At the time of execution this was pulled up to the top of the frame, in which was a groove on each side for it to slide in. The prisoner's neck being fastened to a bar underneath, on a sign given the cutting iron was let loose, and the head instantly severed from the body.

Maiden Queen, in England, a popular title bestowed upon Queen Elizabeth.

Maidenhair Fern. See FERNS AND FERN ALLIES.

Maid'stone (Saxon MEDWEGESTUN) England, municipal and parliamentary borough and the county town of Kent; 32 miles south-southeast from London; on the banks of the Medway. The town consists chiefly of four principal streets, which cross each other at the market-place, with smaller ones branching off at right angles. It has a fine old church and one of the largest parish buildings in the kingdom, supposed to be of the 14th century. It has excellent educational institutions; schools, libraries, science and art institutions, museums, play grounds, and parks. The chief industries are paper-making (for which there are several large mills) and brewing. An extensive trade is carried on in fruit and hops. The Medway is navigable for 15 miles above the town. Pop. (1901), 33,516. Consult: Cave-Browne, 'Maidstone'; Russell, 'History of Maidstone.'

Maidu People, an aboriginal Pujunan group of Indians of northern California, of which the chief tribe, the Concow, inhabited the region of the Upper Sacramento River. Their descendants are to be found in the Round Valley Reservation. Their communities comprised rough dwelling-places or hogáns built of boards, large circular halls or town-houses for assemblies and ceremonials, and wicker storehouses for the winter supply of acorns which with piñons formed their staple food supplies. Their clothing was of the scantiest description; the chief of their numerous dances was the acorn dance; and they had a secret male society in which the initiatory age was twelve.

Maignan, Albert, äl-bär mā-nyän, French painter: b. Beaumont, Sarthe, 15 Dec. 1844. He studied at Paris under Nöel and developed a strong and original manner in historical and landscape painting. At the Salon of 1879 he was awarded a first class medal. Amongst the most striking of his pictures are 'Dante's Meeting with the Countess Matilda' (1881) now in the Luxembourg; and 'Assault on Pope Boniface VIII. at Anagni' in the New York Metropolitan Museum of Art.

Maigre, mā'gėr, or **Meagre,** a large European drum-fish (*Sciæna aquila*), common in the Mediterranean, where it forms one of the most important local food-fishes. It may attain a length of six feet, and its flesh has always been a favorite with epicures. Yarrell says that anciently on account of its large size it was always sold in pieces, and that the fishermen of Rome were accustomed to present the head, considered the finest part, as a sort of tribute to the three local magistrates who acted for the time as the conservators of the city.

Mail-shell. See CHITON.

Maildun, māl'doon, hero of Irish romance. He was the son of Allil Ocar Aga, of the tribe of Owenaught of Ninus, in County Clare, and before his birth his father was killed by pirates. He grew up handsome and accomplished, but had scarce reached manhood before he set sail with a crew of 60 men to find his father's murderer. For three years and seven months he voyaged on the Western Ocean seeing marvels such as no eyes had seen before. At length he found the murderer of his father, but pardoned him his wrong in gratitude to the great mercy of God who had delivered him from so many perils. See Tennyson, 'The Voyage of Maeldune.'

Maimon, mī'mōn, Solomon, German philosopher: b. near Mir in Minsk, 1754; d. Siegersdorf, Lower Silesia, 22 Nov. 1800. He was trained for a rabbi, but having become acquainted with the philosophy of Maimonides, he made his way to Berlin, and studied modern philosophy, languages, and some science. Besides cultivating his own mind, and teaching a little, he wrote some philosophical treatises and literary hack-work. Yet he had Mendelssohn, the philosopher, among his friends, was admired by Kant, and attracted the attention of Goethe. This he owed to his 'Attempt at a Philosophy of Transcendentalism' (1790), in which he set out to supplement Kant's system with truths gleaned for the most part from Spinoza, Leibnitz, Hume, Locke, and others.

Maimonides, mī-mŏn'ĭ-dēz, properly Moses Ben Maimon Ben Joseph (Arabic, Abu Amram Musa ibn Maimun Obeid Allah al-Korlobi), Jewish scholar: b. Cordova, Spain, 30 March 1135; d. 13 Dec. 1204. At an early period he developed a taste for the exact sciences and for philosophy. He read with zeal not only the works of the Mohammedan scholastics, but also those of the Greek philosophers in such dress as they had been made accessible by their Arabian translators. In this way his mind, which by nature ran in logical and systematic grooves, was strengthened in its bent; and he acquired that distaste for mysticism and vagueness so characteristic of his literary labors. He went so far as to abhor poetry, the best of which he declared to be false, since it was founded upon pure invention — and this too in a land which had produced such noble expressions of the Hebrew and Arab muse. It is strange that this man, whose character .was that of a sage, and who was revered for his person as well as for his books, should have led such an unquiet life, and have written his works so full of erudition with the staff of the wanderer in his land. For his peaceful studies were rudely disturbed in his 13th year by the invasion of the Almohades, or Mohammedan Unitarians, from Africa. They not only captured Cordova, but set up a form of religious persecution which happily is not always characteristic of Islamic piety. Maimonides' father wandered to Almeria on the coast; and then (1159) straight into the lion's jaws at Fez in Africa,— a line of conduct hardly intelligible in one who had fled for the better exercise of the dictates of conscience. So pressing did the importunities of the Almohad fanatics become, that together with his family Maimonides was compelled to don the turban, and to live for several years the life of an Arabic Marrano. This blot upon his fair fame — if blot it be — he tried to excuse in two treatises, which may be looked upon as his «Apologia pro vita sua»: one on the subject of conversion in general (1160), and another addressed to his co-religionists in southern Arabia on the coming of the Messiah. But the position was untenable and in 1165 we find Maimonides again on the road, reaching Accho, Jerusalem, Hebron, and finally Egypt. Under the milder rule of the Ayyubite caliphs, no suppression of his belief was necessary. Maimonides settled with his brother in Old Cairo or Fostat; gaining his daily pittance, first as a jeweler, and then in the practice of medicine; the while he continued in the study of philosophy and the elaboration of the great works upon which his fame reposes. In 1177 he was recognized as the head of the Jewish community of Egypt, and soon afterward was placed upon the list of court physicians to Saladin. When he died, his body was taken to Tiberias for burial.

Perhaps no fairer presentation of the principles and practices of rabbinical Judaism can be cited than that contained in the three chief works of Maimonides. His clear-cut mind gathered the various threads which Jewish theology and life had spun since the closing of the Biblical canon, and wove them into such a fabric that a new period may fitly be said to have been ushered in. The Mishnah had become the law-book of the Diaspora; in it was to be found the system of ordinances and practices which had been developed up to the 2d century A.D. In the scholastic discussions in which the Jewish schoolmen had indulged their wit and their ingenuity, much of its plain meaning had become obscured. At 23 Maimonides commenced to work upon a commentary to this Mishnah, which took him seven years to complete. It was written in Arabic, and very fitly called 'The Illumination'; for here the philosophic training of its author was brought to bear upon the dry legal mass, and to give it life as well as light. The induction of philosophy into law is seen to even more peculiar advantage in his 'Mishnah Tōrah' (Repeated Law). The scholastic discussions upon the Mishnah had in the 6th century been put into writing, and had become that vast medley of thought, that kaleidoscope of schoolroom life, known by the name of Talmud. Based upon the slender framework of the Mishnah, the vast edifice had been built up with so little plan and symmetry that its various ramifications could only be followed with the greatest difficulty and with infinite exertion. In turn, the Talmud had supplanted the Mishnah as the rule of life and the directive of religious observance. Even before the time of Maimonides, scholars had tried their hand at putting order into this great chaos; but none of their efforts had proved satisfactory. For ten years Maimonides worked and produced this digest, in which he arranged in scientific order all the material which a Jewish jurist and theologian might be called upon to use. Though this digest was received with delight by the Jews of Spain, many were found who looked upon Maimonides' work as an attempt to crystallize into unchangeable law the fluctuating streams of tradition. The same objection was made to his attempt to formulate into a creed the purely theological ideas of the Judaism of his day. His 'Thirteen Articles' brought on a war of strong opposition; and though in the end, the fame of their author conquered a place for them even in the Synagogue Ritual, they were never accepted by the entire Jewry. They remained the presentation of an individual scholar.

But his chief philosophical work, his 'Guide of the Perplexed' (Dalālat al Hāirin), carried him still further; and for centuries fairly divided the Jewish camp into two parties. The battle between the Maimonists and anti-Maimonists waged fiercely in Spain and Provence.

In the 'Guide of the Perplexed' Maimonides has also produced a work which was «epoch-making» in Jewish philosophy. It is the best attempt ever made by a Jew to combine philosophy with theology. Aristotle was known to Maimonides through Al-Farābi and Ibn Sinâ (Avicenna); and he is convinced that the Stagyrite is to be followed in certain things, as he is that the Bible must be followed in others. In fact, there can be no divergence between the two; for both have the same end in view,—to prove the existence of God. The aim of metaphysics is to perfect man intellectually; the same aim is at the core of Talmudic Judaism. Reason and revelation must speak the same language; and by a peculiar kind of subtle exegesis—which provoked much opposition, as it seemed to do violence to the plain wording—he is able to find his philosophical ideas in the text of the Bible. But he is careful to limit his acquiescence in Aristotle's teaching to things which occur below the sphere of the moon. He was afraid of coming into contact with the foundations of religious belief, and of having to deny the existence of wonders. The Bible teaches that matter was created, and the arguments advanced in favor of both the Platonic and Aristotelian views he looks upon as insufficient. The Jewish belief that God brought into existence not only the form but also the matter of the world, Maimonides looks upon much as an article of faith. The same is true of the belief in a resurrection. He adduces so little proof for this dogma that the people of his day were ready to charge him with heresy.

Maimonides is able to present 25 ontological arguments for his belief in the existence, unity, and incorporeality of God. What strikes one most is the almost colorless conception of the Deity at which he arrives. In his endeavor to remove the slightest shadow of corporeality in this conception, he is finally led to deny that any positive attributes can be posited of God. Such attributes would only be «accidentia»; and any such «accidentia» would limit the idea of oneness. Even attributes which would merely show the relation of the Divine Being to other beings are excluded; because he is so far removed from things non-Divine, as to make all comparison impossible. Even existence, when spoken of in regard to him, is not an attribute. In his school language, the «essentia» of God involves his «existentia.» We have therefore to rely entirely upon negative attributes in trying to get a clear concept of the Deity.

If the Deity is so far removed, how then is he to act upon the world? Maimonides supposes that this medium is to be found in the world of the spheres. Of these spheres there are nine: «the all-encompassing sphere, that of the fixed stars, and those of the seven planets.» Each sphere is presided over by an intelligence which is its motive power. These intelligences are called angels in the Bible. The highest intelligence is immaterial. It is the *noûs poiētikós*, the ever-active intellect. It is the power which gives form to all things, and makes that which was potential really existent. «Prophecy is an emanation sent forth by the Divine Being through the medium of the active intellect, in the first instance to man's rational faculty and then to his imaginative faculty. The lower grade of prophecy comes by means of dreams, the higher through visions accorded the prophet in a waking condition. The symbolical actions of the prophets are nothing more than states of the soul.» High above all the prophets Maimonides places Moses, to whom he attributes a special power, by means of which the active intellect worked upon him without the mediation of the imagination. The psychological parts of the 'Guide' present in a Jewish garb the Peripatetic philosophy as expounded by Alexander of Aphrodisia. Reason exists in the powers of the soul, but only potentially as latent reason (*noûs húlikos*). It has the power to assimilate immaterial forms which come from the active reason. It thus becomes acquired or developed reason (*noûs epiktētos*); and by still further assimilation it becomes gradually an entity separable from the body, so that at death it can live on unattached to the body. In ethics Maimonides is a strong partisan of the doctrine of the freedom of the will. No one moves him, no one drives him to certain actions. He can choose, according to his own inner vision, the way on which he wishes to walk. Nor does this doctrine involve any limitation of the Divine power, as this freedom is fully predetermined by the Deity. But Maimonides must have felt the difficulty of squaring the doctrine of the freedom of the will with that of the omniscience of God; for he intrenches himself behind the statement that the knowledge of God is so far removed from human knowledge as to make all comparison impossible. Again, in true Aristotelian style, Maimonides holds that those actions are to be considered virtuous which follow the golden mean between the extremes of too much and too little. The really wise man will always choose this road; and such wisdom can be learned; by continued practice it can become part of man's nature. He is most truly virtuous who has reached this eminence, and who has eliminated from his own being even the desire to do wrong.

The daring with which Maimonides treated many portions of Jewish theology did not fail to show its effect immediately after the publication of the 'Guide.' His rationalistic notions about revelation, his allegorizing interpretation of Scripture, his apparent want of complete faith in the doctrine of resurrection, produced among the Jews a violent reaction against all philosophical inquiry, which lasted down to the times of the French Revolution. Even non-Jews looked askance at his system. In Montpellier and in Paris, his own Jewish opponents, not content with having gotten an edict against the use of the master's writings, obtained the aid of the Church (for the 'Guide' had been translated into Latin in the 13th century), and had it publicly consigned to the flames. But all this was only further evidence of the power which Maimonides wielded. The Karaites copied it; the Kabbalah even tried to claim it as its own. Many who were not of the House of Israel, as Thomas Aquinas and Albertus Magnus, acknowledged the debt they owed the Spanish rabbi; and Spinoza, though in many places an opponent, shows clearly how carefully he had studied the 'Guide of the Perplexed.' Consult Yellin and Abrahams, 'Maimonides,' and the authorities there mentioned.

GUSTAV GOTTHEIL.

Main, mān, **Hubert Platt**, **American composer and editor**: b. Ridgefield, Conn., 17 Aug. 1839. He was educated in the public schools and for 45 years has been editor of song collections and other publications for church use, besides composing many hymns. He has also published ‘A Dictionary of American Musicians and Poets.’

Main, mān (Ger. mīn), or **Mayn**, a river of Germany, which has its source in the northeastern part of Bavaria, about 13 miles northwest of Baireuth. It flows northwest to the border of Bavaria, and then makes a succession of remarkable zigzags, continuing, however, in a westerly direction, till it reaches the border of the grand-duchy of Hesse, which it enters. It then flows circuitously west, partly forming the boundary between Hesse and the Prussian province of Hesse-Nassau, and joins the Rhine a little above the town of Mainz, after a course of over 300 miles. The principal cities which it passes are Würzburg, Aschaffenburg, and Frankfort. It is navigable for about 200 miles, and by improvements the largest Rhine steamers can ascend to Frankfort. By means of King Ludwig's Canal it affords through navigation to the Danube.

Maine, mān, Sir **Henry James Sumner**, English jurist: b. Caverham Grove, Oxfordshire, England, 15 Aug. 1822; d. Cannes, France, 3 Feb. 1888. He was educated at Cambridge, where he was professor of Civil Law 1847–52. In 1852 he became reader on Roman law at the Inns of Court, London, and ten years later went to India where he was legal member of the council 1862–9. On his return, in 1869, he was appointed professor of jurisprudence at Oxford, 1869–78, and held this post till 1878. He was master of Trinity Hall, Cambridge, 1877, and professor of international law at Cambridge, 1887–88. Among his more noted works were: ‘Roman Law and Legal Education’ (1856); ‘Ancient Law’ (1861), an epoch-making book; ‘Village Communities’ (1871); ‘Popular Government’ (1855). Consult: Duff, ‘Sir Henry Maine: a Brief Memoir of his Life’ (1892).

Maine de Biran, François Pierre Gonthier, frän-swä pē-är gŏn-tē-ā mān dė bē-rŏn, French philosopher: b. Bergerac (Dordogne) 29 Nov. 1766; d. Paris 16 July 1824. He entered the Life Guards of Louis XVI. in 1784, was present at Versailles on 5–6 Oct. 1789, but was not concerned in the Revolution. He opposed Napoleon in the latter part of his reign, and became a legitimist at the restoration. His chief philosophical essays are: ‘Influence de l'Habitude’ (1803); ‘Sur la Décomposition de la Pensée’ (1805); ‘Sur l'Apperception Immédiate’ (1807); and ‘Rapports du Physique et du Moral’ (1811). Maine de Biran's importance as a philosopher is chiefly due to his giving the direction to philosophic speculation afterward developed in the school founded by Victor Cousin.

Maine (name given as early as 1622 to distinguish the *mainland* from the islands. It was called in the Mason and Gorges Patent, «the Mayn Land of New England,» and in the great charter, «the Province of Maine»), one of the New England group of North Atlantic States and the most easterly State of the Union. It is between lat. 43° 6′ and 47° 27′ 33″ N. and lon. 66° 56′ 48″ and 71° 6′ 41″ W. The 45th parallel crosses the State within 30 miles of its geographical centre. This position, almost precisely equidistant between the equator and the pole influences the water-power of the State in an important degree, and chiefly through its meteorological conditions. It is bounded on the north by Quebec and New Brunswick, provinces of Canada, on the east by New Brunswick and the Atlantic Ocean, on the south by the Atlantic, and on the west by the State of New Hampshire and the Province of Quebec. Its greatest extent is from north to south; its greatest length about 303 miles and its greatest width about 212 miles; area 31,500 square miles, of which 3,000 square miles are water surface. Maine is within 385 square miles of being as large as all the rest of the New England group, and is the 35th in size among the States of the Union.

Topography.—The northeastern and southwestern boundaries are straight lines except a portion of the extreme southwestern boundary. The northern, northwestern, and southeastern boundaries are irregular. The coast line is fringed by islands and indented by numerous bays, and in length, measured from Eastport to the southernmost extremity in a direct line, is about 226 miles; but Maine has really about 2,500 miles of sea coast. The coast from the eastern extremity to Penobscot Bay is high and rugged. The greater part of the coast of York County, in the southwest, is low.

There are two general mountain slopes in Maine, the highest part extending across the State from north of the source of the Megalloway River in the west, northeast to Mars Hill. South of the main divide is Mount Katahdin, 5,385 feet in height; Mount Abraham in the west, in Franklin County, is 3,387 feet high; Saddleback Mountai.., 4,000 feet, and Mount Blue, 3,900 feet, are in the same county. Green Mountain on Mount Desert Island is 1,800 feet high, and is one of numerous peaks more or less conical in form, isolated or in clusters, comparatively bare of soil, and densely wooded about their bases. There is no long range of mountains in the State.

Hydrography.— That portion of the State north of the main divide is drained almost wholly by the Saint John River and its tributaries, and the part south of the main divide is drained chiefly by the Androscoggin, Kennebec, Penobscot, and Saint Croix rivers. The basin of Saint John River has an area of about 7,425 square miles. The head-waters of this river are in the northwestern part of Maine and the eastern part of Quebec, and it flows north by east for some distance past Saint Francis on the north to the extreme northeastern boundary, where it makes a turn and flows generally southeast through New Brunswick to the Bay of Fundy. The largest Maine tributaries of the Saint John are the Aroostook and the Allegash. The waters of a large number of the lakes of Maine find their outlet through the Saint John. The rivers south of the main divide flow generally south to the ocean. The source of the Kennebec is about 2,000 feet above the sea, of the Penobscot over 2,300 feet, of the Androscoggin about 3,000 feet, of the Saco in the southwest nearly 2,000 feet. They, together with their tributaries, are swiftly flowing streams, in many places passing over rocky beds which form rapids and falls and furnish extensive water-powers. The available water-power of the State has been estimated at nearly 3,000,00 horse-power. The flow of the tide is so great on the coast that it has been estimated "That with suitable wheels it can be operated sixteen hours out of the twenty-four." There are about 1,580 lakes in Maine, a large number of which are near the sources of the rivers. The surface of the lakes and rivers constitutes nearly one tenth of the whole area of the State. Moosehead Lake is the largest in the State. (For description of rivers, see separate articles.)

Geology.— The nature of the geological formation of Maine shows that it belongs to one of the oldest parts of the United States. The marks of the Glacial period may be plainly traced in several parts of the State; the changes in extent and form of the river beds and lakes are shown by the rock formation of the vicinity and the nature of the deposits which were brought from the mountains to the valleys. The northern portion of the State belongs to the Devonian period and the region about Penobscot Bay to the Silurian. In the southern part of the State are fossiliferous clays. There are a number of low ridges which evidently were once portions of mountain ranges, but which usually formed angles with the two great ranges that at one time extended across the State. Granite, slate, and marble exist in large quantities.

Soil.— The soil of the State shows the effects of the Glacial period as much as the rocks; the greater part of the surface is till and various forms of glacial debris. The old lake bottoms, now dry land, are largely alluvial and in these places the soil is very fertile. In such localities there are extensive agricultural lands.

Minerals and Mining.— Granite is one of the most important wealth producing minerals of the State. Along the coast and inland for some distance there are large areas of granite outcrop. It is found in such quantities near tide water that quarrying and shipping are comparatively easy and inexpensive. The feldspar and quartz are easily separated. Hallowell, Dix Island, Vinal Haven, and Freeport furnish the largest quantity. The Capitol at Albany, N. Y., and the Metropolitan Museum of Art, New York city, are built of granite from Hallowell. Crystalline limestone and marble are found in several places; in the southwestern part of the State the deposits are quite extensive. Slate of good quality is found in the central part of the State. It is quarried for table tops, blackboards, roofing and for mantels. The slate from Piscataquis County is remarkably pure, capable of being split into thin plates, and in color a deep blue-black. Silica and feldspar of an excellent quality are found in several places. Some of the products made in whole or in part from silica and feldspar are glass, porcelain, scouring soap, sandpaper, earthenware, and woodfiller. The silica is found in vein-quartz in some of the crystalline rocks. Tourmalin is found in Oxford County in large and beautiful crystals. Some of the other minerals are iron, copper, zinc, arsenic, manganese, tin, silver, gold, antimony, pyrites, and beryl. The value of the mineral output for 1899 was: granite, $1,321,182; limestone and marble, $1,028,375; slate, $181,766; silica, $50,336; other mineral products, $60.126, making the total amount for quarry purposes for 1899, $2,641,785. Maine ranks second among the States in the output of granite; fourth in the output of slate and sixth in the output of limestone and marble.

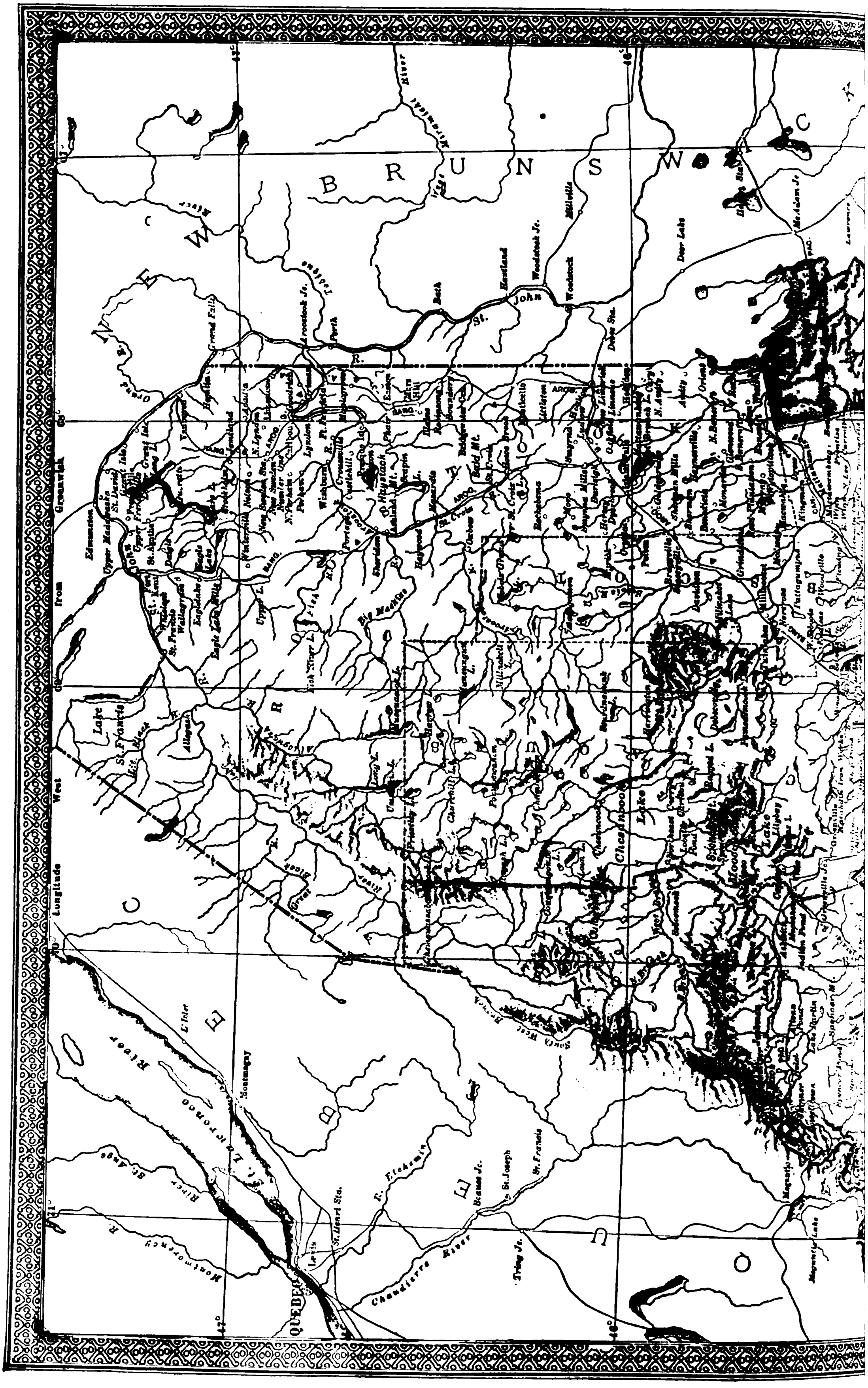
There are in the State nearly 30 mineral springs which are known and used; 10 of them are in Androscoggin County. In 1899 the State reported of 26 springs an output of 1,850.132 gallons for $179,450.

Climate.— The climate is cold a considerable part of the year; snow covers the ground from three to five months. The summers are short; in the southern part of the State there is not more, usually less, than five months for the maturing of crops. The extensive forests have been a protection, and with the good river drainage and the sea breezes have tended to make the climate most healthful. The mean temperature in January is 15° F.; in May 52°; in July 68°; in October 51°; in December 22°. The average temperature in the whole State is in summer 62.5° F. and in winter 20° F.

Flora.— The trees and plants common to the northeastern part of the United States flourish here. In the southern part are fine grasses, hardy fruits, and a varied shrubbery. The strawberry, blackberry, raspberry, blueberry, thorn-apple, and gooseberry grow in all parts of the State. (See *Forests* and *Agriculture.*)

Fauna.— Maine has a large number and variety of animals, among which are deer, moose, fox, beaver, sable, marten, mink, weasel, squirrel, rabbit, porcupine, and wildcat. Wild geese, ducks and teal are found in the vicinity of the lakes; fish-hawks and gulls on the coast; plovers, orioles, bobolinks and all the birds of other parts of New England are common. The lakes and rivers are filled with fish, and the coast fisheries are most valuable. (See *Fisheries.*)

Forests.— Maine is known as the "Pine Tree State" because of the large extent of pine forests which once existed within its limits. The majestic "mast pine," which the State once furnished for many ships, has almost become a thing of the past, yielding to the demands of commerce. The greater part of the State is covered with forests; about 66 per cent of the land area in 1902 was woodland. The northern and central parts are forest; in the southern part along the coast and along the navigable streams the land is cleared and cultivated. Trees grow rapidly. Denuded tracts, unless cultivated, will soon send up an undergrowth which become trees of fair size in the course of a few years. Actual deforestation, except from forest fires, can never take place to any considerable extent in Maine, as the agricultural lands are very largely occupied. Nearly all the lumber of Maine used in the manufacture of pulp and paper has been taken from the drainage of the Androscoggin, Kennebec and Penobscot rivers, in the following proportions: 42 per cent from the Androscoggin; 33 per cent from the Kennebec; and 35 per cent from the Penobscot. Practically there has been none taken from the Saint John's River or from the southeastern portion of the State in Washington and Hancock counties, both being large wild land regions. The total average of these three systems from which the whole pulp lumber consumed in the State has been taken is about 4,741,000 acres, leaving more than one half the entire wild land region from which no pulp wood of any consequence has ever been removed. There


NEW BRUNSWICK
QUEBEC
Longitude West from Greenwich
St. John R.
St. Lawrence River
Chaudière River
Lake St. Francis
Lake Chesuncook
Moosehead Lake
QUEBEC
Lévis
Montmagny
Woodstock
Houlton
Grand Falls
Edmundston
Megantic

In 1899 the farm animals were:

	Number.	Value.
Horses	109,747	$6,432,826
Sheep	254,027	787,484
Milch cows	203,814	5,890,225
Other cattle	112,723	2,973,863

Manufactures.— The extensive water-power has been a great aid in developing manufacturing industries. Ship-building was among the first manufacturing industries of the State. The first vessel built in Maine was the Virginia. She was built by the Popham Colony 1607–8, and under command of Captain James Davis sailed from Plymouth with the Somers and Gates Colony for Jamestown, 1 June 1609. Bath was the chief ship-building centre of the United States for over 100 years, and is yet a ship-building centre of importance. Prior to the construction of steel vessels, the Maine forests supplied a large amount of the timber used in ocean vessels built in the United States and fully half the ocean vessels of the nation, up to 1900, were made in Maine. Bath builds now many steel vessels. The manufacture of leather is another of the leading industries. The bark of the hemlock is used in large quantities for tanning. The manufacturing of cotton and woolen goods began the latter part of the 18th century and has been continued. Lewiston is the chief centre of cotton manufacturing. There is a tendency now to remove the cotton manufacturing industry to the Southern States or nearer the supply of raw material. Biddeford and Saco are extensively engaged in manufacturing cotton goods. Woolen mills are scattered throughout the State. The oil cloth industry was first started in Maine in 1845 by C. M. Bailey of Winthrop (q.v.). Nearly all the factories are located near the coast, or in localities where abundant water-power and good transportation lessen the cost of production and shipping. Lime and cement are important manufacturing products; large quantities of lime are made in Knox County. The following comparative table from the Federal census for 1900 will give some idea of the value of the manufacturing industries.

INDUSTRIES.	Year	Number of establishments	Capital	Value of products including custom work and repairing
Total for selected industries for State..	1900	1,689	$86,564,100	$73,368,312
	1890	1,580	56,706,127	54,631,124
Increase, 1890 to 1900.....................	....	109	29,857,973	18,737,188
Per cent of increase.......................	....	6.9	52.7	34.3
Per cent of total of all industries in State.	1900	25.2	70.4	57.6
	1890	31.5	70.5	57.1
Cotton goods	1900	15	21,087,190	14,631,086
	1890	23	20,850,754	15,316,909
Fish, canning and preserving.............	1900	117	8,481,056	4,779,733
	1890	35	527,420	1,660,881
Flouring and grist mill products...........	1900	227	1,235,767	3,399,832
	1890	210	1,194,900	3,254,690
Foundry and machine-shop products.......	1900	112	4,032,950	3,298,706
	1890	82	3,024,473	2,628,572
Leather, tanned, curried and finished......	1900	31	1,376,106	2,451,713
	1890	51	2,231,702	3,363,672
Lumber and timber products..............	1900	838	15,764,538	13,489,401
	1890	894	12,978,315	11,849,654
Paper and wood pulp....................	1900	35	17,473,160	13,223,275
	1890	17	4,273,825	3,281,051
Printing and publishing, newspapers and periodicals	1900	120	1,140,152	2,190,017
	1890	105	1,315,820	1,719,477
Ship and boat building, wooden...........	1900	115	1,027,756	2,491,765
	1890	85	14,128,693	2,818,565
Wool manufactures	1900	79	9,456,830	13,412,784
	1890	78		8,737,653

Political Divisions.—Maine is divided into 16 counties, as follows: Androscoggin, Aroostook, Cumberland, Franklin, Hancock, Kennebec, Knox, Lincoln, Oxford, Penobscot, Piscataquis, Sagadahoc, Somerset, Waldo, Washington, York.

The principal cities of Maine are Portland, the metropolis, founded in 1632; Lewiston, Bangor, Bath, Augusta, Saco and Biddeford, each of which is treated in a separate article.

Banking Institutions.— There were in 1903 84 national banks doing business in this State, having capital stock $10,141,000, surplus and profits $5,391,696, circulation $5,785,955, deposits $27,975,672, United States bonds $6,313,350, loans and discounts $29,285,840, total resources $50,224,268. Also 51 mutual savings banks with deposits of $75,107,203, and total assets of $80,538,169, belonging to 209,011 depositors: also, 23 trust and banking companies having capital stock $2,022,000, surplus and profits $1,460,826, deposits $15,266,085, and total assets $19,914,000; also, 35 loan and building associations holding could read or write in any language. A law of 1821 required that not less than 40 cents per capita of all inhabitants should be raised annually for school purposes. A public school fund was created in 1828 by setting apart 20 townships of lands belonging to the State. Moneys received from the United States for claims for services rendered in the War of 1812 were set apart for educational purposes. The compulsory law which covers the ages from 7 to 15 is strictly enforced. The district system has been abandoned and, instead the town system is in use. Since 1873 the State has aided towns where free academic instruction is given to the pupils. This instruction may be given in a high school within the town, or, since 1889, the town authorities may arrange for the education of its pupils with a high school outside the town. The number of free high schools receiving State aid in 1901 was 211. State institutes or summer schools for teachers are maintained by the State under the supervision of the State superintendent. The Indians are well provided with schools. The teachers' examinations and certificates are uniform and are in charge of the State. Strong efforts are made to have all the teachers normal school graduates. In 1903 about 25 per cent of those teaching in the schools were normal graduates.

Charitable Institutions.— There is a National Soldiers' Home at Togus, a United States Marine Hospital at Portland, State Insane Asylums at Augusta and Bangor, Military and Naval Orphan Asylum at Bath. There is also a Law School at Bangor, a College of Pharmacy at Orono, and Agricultural Experiment Station, all connected with the University. There are State Normal Schools at Farmington, Castine, Gorham and Presque Isle. The State General Hospital, State Reform School, School for Deaf Mutes, Maine Medical School, and Eye and Ear Infirmary, Home for Aged and Indigent Women, Old Men's Home, two Orphan Asylums (Protestant and Catholic), Young Men's Christian Association and Young Women's Christian Association, all located at Portland. City Hospital at Augusta, Central Maine at Lewiston, Eastern Maine General Hospital at Bangor, also at Bar Harbor, Old Town, and Rockland. There are two hospitals, five orphanages, and one Home for the Aged, under the auspices of the Roman Catholic Church.

Penal Institutions.— The State prison is at Thomaston, the State Industrial School for Girls at Hallowell, and the State Reform School about two miles from Portland. Prisoners in the county jails and convicts in the State prison are obliged to work, and the products of their labor are sold in the markets. Contracts are sometimes made for the labor of prisoners in the jails of some of the counties. The work of the inmates of the reform school is usually on the farm and in workshops. The girls at the industrial school are taught domestic work and some trades.

History.— Maine is supposed to have been visited by the earliest explorers: Corte-Real in 1501, and Verrazano in 1524, reported a coast the description of which corresponds with that of Maine. Gomez in 1525 sailed along the coast and named the Penobscot River, Rio de las Gamas, or Stag River. Sir John Hawkins, the famous Elizabethan seaman, explored the coast in 1565, and Sir Humphrey Gilbert in the voyage which cost his life was on his way to the Penobscot region, then known as Norumbega, to settle a colony under a patent from Elizabeth. Bartholomew Gosnold, an Englishman (one of the founders of Jamestown, Va.), explored the coast in 1602, and Maine was visited by Martin Pring, in 1603, by De Monts in 1604, and by Weymouth in 1605. The first attempt to settle on the territory was made by the French under De Monts, who, having received a patent from the French king, planted a small colony on Neutral Island in the Saint Croix River in 1604. The first colony settlement attempted by the English was at the mouth of the Sagadahoc by George Popham and Raleigh Gilbert in 1607. A fort was erected and a number of buildings, and here the Virginia, the first vessel built in the country, was launched and subsequently formed one of the fleet of the Somers and Gates Colony in 1609. The colony at Sagadahoc was broken up by the death of Popham and great hardships endured by the colonists. They returned to England in the autumn of 1608. In 1613, French Jesuits established a mission on Mount Desert Island, but they were expelled by the English the next year. In 1614, the coast was visited by John Smith, who found a few scattered settlers around Pemaquid Bay and on the island of Monhegan, off the coast of that part of the State now included in Lincoln County. In 1616 Sir Ferdinando Gorges, "The father of American Colonization," who had sent Pring and Popham to Maine, sent his agent, Richard Vines, to Saco to remain during the winter to explore the country and test the climate. In 1620, the King of Great Britain made a division of the grand charter of 1606, and granted to the Plymouth Company in England the whole country lying between 40° and 48° N., and to the Virginia Company the southern portion of the original patent. On 10 Aug. 1622, Gorges received a patent of territory between the Merrimac and Kennebec rivers, and the next year sent his son Robert as Governor and Lieutenant-General of the country, accompanied by several councillors and a minister of the Church of England to establish worship. In 1629, another division of lands was made giving to Sir Ferdinando Gorges the country between the Piscataqua and Kennebec rivers, to which he gave the name of New Somersetshire, and the remainder to John Mason. The first court in the Province was convened by William Gorges, nephew of Sir Ferdinando, at Saco, 21 March 1636. Charles I. granted to Gorges in 1639 a charter under which in 1641 Gorges established the first chartered city in the United States, under the name of Gorgeana, and constituted it the capital of the province. What was then Gorgeana is now York. Its original name was Agamenticus. A fort was built here and efforts made to protect the people against the Indians. From 1630 to 1632, settlements were commenced in Saco Biddeford, Scarboro, Cape Elizabeth, and Portland, all of which continued to prosper till th Indian War of 1675, when they were overthrown. Massachusetts claimed a portion a least of the territory of Maine on the groun that its charter included the lands as far north as three miles above the source of the Merrimac; but those to whom other charters had

of seven members was created. From the day of opening, in 1868, when twelve students enrolled themselves, the institution has prospered. Until 1897 the institution was known by the name «State College of Agriculture and Mechanic Arts.» The legislature of 1897 changed the name to «The University of Maine.» The most rapid progress has been noticed since the change of name. The University of Maine includes all that there was in the Technical College and appeals also to a broader constituency. The number of students (1904) is 551.

Although the institution is by law co-educational, the number of female students has never exceeded 30 at any one time. This is accounted for by the fact that the technical courses attract large numbers of young men, and that there are two other colleges in the State which admit women. The faculty numbers 65. There are 23 departments in which instruction is given. These departments are divided into colleges of Arts and Sciences, Agriculture, Technology, Pharmacy, and Law. The degree of B.A. is given for the completion of such courses in the College of Arts and Sciences as contain a minimum of one year of Latin. The degree of B.S. is given for all other courses in the Colleges of Arts and Sciences, of Agriculture, Technology, and Pharmacy. The degree of LL.B. is given those who graduate from the College of Law.

In the College of Arts and Sciences instruction is given in the departments of Greek, Latin, Romance Languages, Germanic Languages, English, Philosophy, Civics, History, Mathematics and Astronomy, Physics, Chemistry and Biology. In the College of Agriculture instruction is given in Agriculture, Animal Industry, and Horticulture. In the College of Technology instruction is given in Chemistry, Civil Engineering, Mechanical Engineering, Electrical Engineering, Mining Engineering, and Forestry. The colleges of Pharmacy and of Law are not subdivided.

Fully one half of the students are pursuing the various engineering or other technical courses. The governing body of the institution is the board of trustees, consisting of eight members, appointed by the governor and council. One of these trustees is appointed from the alumni upon recommendation of the alumni association. There are upon the grounds 14 buildings which are used for purposes of instruction, and 17 other buildings which are used as dormitories, residences, dining halls, etc. The engineering, chemical, and biological laboratories are thoroughly equipped. The museum contains specimens of all the animals and birds of Maine and many of other parts of the United States. The library contains about 27,000 volumes. An astronomical observatory is equipped with an eight-inch refracting telescope, together with other instruments of the best quality and of sufficient number for thorough instruction in both descriptive and practical astronomy.

Entrance to the university is obtained by passing the entrance examinations, or by presenting a certificate from one of the schools approved by the New England College Entrance Certificate Board. This is an organization composed of the larger number of the New England colleges. All of the colleges in the organization will accept certificates from schools which have been approved by the executive committee of the board.

The University Council, composed of four members of the faculty, and five students, elected by the two upper classes, is a body with advisory powers which exerts the chief influence in the determination of all student and faculty relations.

Great interest is taken by the student body in all branches of athletics, and this interest is heartily approved by the faculty. Strong teams compete each year with those of other New England colleges, in baseball, football, basket-ball, tennis and track games. The students also maintain an excellent band, an orchestra, a glee club, banjo, guitar and mandolin clubs, and debating club. A noteworthy feature of student life at the University of Maine is found in the chapter houses of the various fraternities. Eight fraternities maintain elegant houses of their own, in which they live as families and frequently entertain their friends. Although a friendly rivalry exists, there is never ill feeling among the fraternities, and all co-operate in furthering all college interests.

The Law School, located in Bangor, was established in 1898. It has an excellent library, maintains a three-year course, and has (1904) 76 students, more than one third of whom are college graduates.

George Emory Fellows,
President of the University of Maine.

Maine, The, a battleship of the United States navy, mysteriously destroyed by explosion 15 Feb. 1898, just prior to the commencement of the Spanish-American war. The disaster, which occurred in the harbor of Havana, Cuba, caused the death of 257 American sailors. (See Cuba: Spanish-American War.) Another warship of the same name was launched in 1903.

Maine de Biran, mān de bē-răn', **Marie François Pierre Gonthier,** French philosopher: b. near Bergerac, in the department of Dordogne, 29 Nov. 1766; d. Paris 20 July 1824. He received his early education at Perigueux, and in 1785 joined the army under Louis XVI. He was elected to the Five Hundred in 1797, became *sous-prefet* of Bergerac in 1806, was made a count of the empire in 1809, and in 1816, after changing his residence to Paris, became a member of the loyal chamber. Only a few of his minor essays were published during his lifetime, but upon his death Cousin obtained access to his papers and published a portion of his works in 1841. Neville printed his ‹Life› in 1851, and in 1859 edited a complete edition of his works, the most important of which are: ‹Nouvelles considerations sur les rapports du physique et du moral de l'homme›; ‹Œuvres philosophiques›; ‹Nouveaux essais d'anthropologie›; and ‹Essai sur les fondements de psychologie.› Maine de Biran was considered the founder of modern French Spiritualism and was much inclined toward mysticism when he died.

Maintenon, Françoise d'Aubigné, frăṅ-swäz dō-bēn-yā măṅ-tē-nôṅ, Marchioness de, French queen: b. Niort, Poitou, 1635; d. Saint-Cyr, 1719. Her birthplace was the prison in rateur des Constitutions politiques' (1810), in which he maintains the divine origin of sovereignty; 'Soirées de St. Petersburg'; 'Du Pape' (1819); 'De l'Eglise gallicane'; and 'Du Congrès de Rastadt' (the last with the Abbé de Pradt).

Maisur, mī-soor'. See Mysore.

Maitin, José Antonio, hō-sā' ăn-tō-nē'ō mī'tăn, Venezuelean poet: b. Porto Cabello 1798; d. Choroni, Venezuela, 1874. In 1824 he returned from Havana to his own country whence he had fled on account of persecution, and made his home in the valley of Choroni. In 1844 his best poems were collected and published with the title 'Echoes from Choroni,' and in 1851 a collected edition of all his works appeared.

Maitland, măt'lạnd, **Frederick William,** English historian: b. England 28 May 1850. He was graduated from Trinity College, Cambridge, and studied law; in 1884 was made reader of English Law at Cambridge and since 1888 has been professor of the same branch there. He has read widely on legal history and is a generally recognized authority. Among his works are: 'Gloucester Pleas' (1884); 'History of English Law,' with F. Pollock (1895); 'Canon Law in England' (1898); 'English Law and the Renaissance' (1901); etc.

Maitland, J. A. Fuller. See Fuller-Maitland, J. A.

Maitland, Sir **Peregrine,** British soldier: b. Hampshire, England, 1777; d. London 30 May 1854. He enlisted in the army in 1792 and was promoted rapidly, serving in Spain and at the battle of Waterloo, where he was a major-general. In 1818 he was appointed lieutenant-governor of Upper Canada and in 1828–34 was governor of Nova Scotia. He was made lieutenant-general in 1830 and commanded the Madras army 1836–8. From 1843–6 he was governor-general at the Cape of Good Hope.

Maitland, Sir **Richard,** Lord Lethington, Scottish poet and antiquary: b. Scotland 1496; d. Edinburgh 20 March 1586. He was educated at St. Andrews and was one of the great lawyers of his day, and although he became blind in 1560 was nevertheless made a member of the privy council, and in 1562 keeper of the great seal. His manuscript collection of early Scottish poetry is preserved at Magdalen College, Oxford, and his own poems were published by the Maitland Club of Glasgow in 1830.

Maitland, William, Scottish statesman: b. Scotland about 1528; d. Leith 9 June 1573. He was a son of Richard Maitland, Lord Lethington, and was educated at St. Andrews and on the Continent. He early entered political life and was interested in the Knox reform movement; in 1558 he was appointed secretary of state by Mary of Guise, and is commonly called "Secretary Lethington." He was one of the commissioners who concluded the treaty of Berwick and in 1560 was speaker of the Scottish Parliament. He was one of Mary's ministers on her return from France, but was suspected of having betrayed her to Queen Elizabeth. In 1563 Maitland conducted a prosecution for treason against Knox whom he had earlier supported, and 1565 he became lord of the sessions but was removed from office for implication in Rizzio's murder; he was also connected with the murder of Darnley. He contrived Mary's escape from Lochleven but fought again [illegible] Langside. After the assassination of Mor[illegible] he became the leader of the queen's p[illegible] was active in her support. In 1571 h[illegible] tainted for treason by Parliament as [illegible] of joining Kirkcaldy at Edinburgh, [illegible] encouraged to hold the castle until the [illegible] was taken prisoner at its surrender a[illegible] prison. Consult: Skelton, 'Maitland o[illegible] Lething-ton and the Scotland of Mary Stuart' (1887–8).

Maitland, Australia, town, in Northumberland County, in New South Wales; on the Hunter River; about 100 miles north of Sydney. It is connected by railroad with Newcastle, about 15 miles distant. The Hunter River divides the town into East and West Maitland, two distinct municipalities, West Maitland being the larger. The Hunter River frequently overflows its banks and floods the town and surrounding country. Although serious devastation results, the soil has been enriched by this flooding, and so fertile is this section that Maitland is called the "granary of New South Wales." Grapes, grains, tobacco, and vegetables grow in abundance. Large coal fields are near the town. Considerable manufacturing is carried on, especially in West Maitland. Pop. (1901) 10,085.

Maize. See Corn, *Indian.*

Majen'die, Sir **Vivian Deri**[illegible] Grange 18 July 1836; d. Oxford, [illegible] April 1898. He was educated at [illegible] College, commissioned in the Royal Artillery in 1854 and first saw active service in the Crimean war, in which he won the medal with clasps, and the Turkish medal, and he achieved further distinction in the Indian Mutiny. He became captain of artillery in 1861, major in 1872, lieutenant-colonel in 1880 and colonel (retired) in 1882. He was created Commander of Bath in 1880 and Knight Commander in 1895. Was 10 years on duty at the Woolwich Arsenal and in 1871 attached to the Home Office as Inspector of Gunpowder Works under the Gunpowder and Nitroglycerin Acts. He was largely instrumental in passing the Explosives Act of 1875.

It was fitting then that after having had so wide an experience and displayed such thorough acquaintance with the subject, Maj. Majendie should, on the passage of the Act, have been appointed chief inspector. While in this office his investigations of dynamite outrages brought him most conspicuously before the public, his most important service to his country was in so drawing and enforcing the regulations in explosive works as to render employment in these factories among the less hazardous of occupations for British workmen while all mankind benefitted from the exhaustive examinations which he made into accidents arising in the manufacture and use of explosive substances and his admirable reports in which he traced out the causes and offered practical suggestions by which to prevent the recurrence of these disasters. His influence has extended far beyond the confines of his country. For his successful efforts to ameliorate the condition of man he takes rank with Davy, Jenner, Francis, Lister and Florence Nightingale. His monument is the 22 Annual and 50 Special Reports which bear his signature

Vienna, and he produced his series of ‘Abundantia’ pictures, ‘Fruits of the Earth’; ‘Fruits of the Sea.’ In 1873 followed the picture which attracted so much attention in the Exhibition of Philadelphia (1876) his ‘Venice Doing Homage to Caterina Cornaro,’ now in the National Gallery at Berlin. He traveled in the East during the winter (1875–6), and his Egyptian sketches materialized in his ‘Cleopatra,’ ‘Antique Hunt on the Nile,’ etc. His ‘Entry of Charles V. into Antwerp’ (1875–8) gained a medal at the Paris Exposition of 1878 and his ‘Diana's Hunting Party’ is one of the most successful of his larger paintings, combining superb coloring and modeling of the nude with grand landscape effect. It is in the Metropolitan Museum of New York and is most characteristic of the gorgeous sensuousness of a painter who woke the intellectualists of German art to a sense of color, and broke free from the traditions of a somewhat stiff and pedantic method, gaining in life and intensity what he sacrificed of academic correctness. Consult: Lützow, ‘Hans Makart’ (1886); Stiassny, ‘Hans Makart und seine bleibende Bedeutung’ (1886).

Mak'emie, Francis, pioneer of the Presbyterian Church in the United States: b. Rathmelton, County Donegal, Ireland, 1658; d. Accomac County, Virginia, 1708. He was a born missionary and zealot, and on being licensed by the Presbytery of Laggan sailed for the British West Indies, and began work in Barbados. In 1684 he sought a wider field in Maryland and organized the first Presbyterian congregation at Snow Hill, capital of Worcester County, Md. After 10 years' labor as an itinerant preacher in most of the Southern States he returned to England and induced two other ministers to accompany him back. He was the first moderator of the Presbytery of Philadelphia (1706), which he assisted in forming; and visited New York (1707), where he was imprisoned for preaching, though when brought to trial was acquitted of lawbreaking. Consult Briggs ‘American Presbyterianism’ (1885).

Malabar, măl-a̤-bär', British India, in the Presidency of Madras, in the southwest bordering on the Arabian Sea. A great portion is low land along the coast, rising abruptly at the east where it is bounded by the Western Ghats. The western part is intersected by long, narrow ravines, and the whole is covered with vegetation, in many place large forests. There are a number of tea and coffee plantations and a large amount of rice is raised. The principal towns are Cochin, Callicut, Tellicherri, Kananur, and Mangalore. The name Malabar is often applied to the whole extent of coast country from Cape Comorin as far north as Bombay.

Malabar Nightshade, a succulent edible vine. See BASELLA.

Malabón, Santa Cruz de, sän'tä crooth dä mä-lä-bōn', Philippines, a pueblo of the province of Rizal, Luzon, also known as Tambóbong. See TAMBÓBONG.

Malabuyoc, mä-lä-boo'yŏk, Philippines, a pueblo of the province of Cebú, situated at the mouth of the Malutuoc River on the strait of Tañon, 60 miles southwest of Cebú, the provincial capital. Pop. 13,120.

Malacca, ma̤-lăk'a̤. See STRAITS SETTLEMENTS.

Malac'ca Cane, an erect, slender-stemmed palm (*Calamus scipionum*) which, when dressed, is of a brown color, sometimes mottled or clouded. It is used principally for walking-sticks, and is brought from Singapore and Malacca, but is chiefly produced in Sumatra.

Malacca, Strait of, the channel between the Malay Peninsula and the Island of Sumatra, extending from lat. 1° to about 6° N. Entire length, about 520 miles; breadth, varying from 25 miles to 250 miles.

Malachi, last of the Hebrew minor prophets: he was contemporary with Ezra, writing about 450 B.C. Malachi's work was supplementary to that of Nehemiah and Ezra, who were struggling to preserve the integrity of the nation by opposing intermarriage with the heathen and to maintain the purity and persistency of the temple worship by which alone priests and people could be kept together as holy to the Lord. The prophet begins his message by showing that Jehovah still loves and favors his own people in contrast to the visitation he had brought upon Edom. He condemns the neglect and moral perversion of the priests who despise and prove ungrateful to God by the profanity of their niggardly offerings. He only is a true priest who recognizes his covenant obligation to God, and whose life and service are in keeping with it. The shortcomings of the people are next dealt with. Their intermarriages with heathen women and their divorces are an abomination. The coming of God's messenger, then of God himself in judgment, is announced. The day of Jehovah is near; in which the righteous shall triumph and the wicked perish. The law of Moses must be observed, and the coming of Elijah expected as a preparation for that day. The book of Malachi is argumentative and practical. It is plain and convincing. The prophet startles his hearers by stating their own objections, and answering them. Thus contemporary moral and religious life are plainly depicted, in the language of rhetoric rather than of poetry.

Mal'achite, a native basic copper carbonate and hydrate, having the composition $CuCO_3.Cu(OH)_2$, crystallizing in the monoclinic system, but commonly occurring in massive form, or as an incrustation. It is brittle, and has a specific gravity of about 4, and a hardness of from 3.5 to 4. Malachite is commonly subtranslucent, with an adamantine lustre. It is beautifully green in color, often banded with other colors, and it occurs in many parts of the world, usually in connection with other ores of copper. Specially fine pieces are found in the Ural district, and at the Nizhni Tagilsk copper mines a deposit is known which contains at least half a million pounds of pure malachite. In the United States, the best known deposits are those of Arizona. Malachite has been much prized as a gem stone, and it is extensively used for panels, clock cases, table tops, and other ornamental work.

Malachy, Saint, Irish bishop: b. Armagh 1095; d. Clairvaux, France, 1148. He belonged to the noble family of O'Morgair, was educated by Iombar, an anchorite, and ordained priest in 1119. He afterward studied at Lismore, and returning to Armagh was chosen bishop of Down and Connor (1125). His subsequent election to stitute a feature most obnoxious to colonization. In the United States, particularly in the Southern States, malaria prevails. Along the New England coast, where it at one time was very common, it has become much diminished in prevalence and in severity. The Pacific coast region is free from the disease, and the Northwest States are comparatively free. In the region of the Saint Lawrence River malaria is unknown.

In order to understand clearly the different forms of malarial fever, it is important to bear in mind that the different types are due to minute animal parasites which enter the blood, usually by the bite of one of a particular genus of mosquitoes (*Anopheles*). (See MOSQUITOES AND THE PROPAGATION OF DISEASE.) The parasite develops after its introduction into the blood and, according to the individual type that is introduced, certain variations in the developmental history of the disease result. The parasites themselves, which are thought to be low forms of animal life, protozoa, develop, for the most part, in the red blood-corpuscles, and have many allies in the red blood-corpuscles of other animals, as frogs, fish, birds, monkeys, cats, etc.

These organisms were first clearly demonstrated by Laveran, a French army surgeon, in 1880, and his early observations were enlarged and amended by Golgi, Marchiafava and Celli, Manson and Ross, and a host of others. At the present time at least three forms of the parasite *Hæmatozoa malariæ* are known, the parasite of tertian fever, the parasite of quartan fever and the parasite of æstivo-autumnal fever. These parasites have two cycles of development, one taking place in the body of man, and the other in the body of the mosquito. Thus a patient with malarial fever infects a mosquito with a parasite which undergoes certain transformations within the body of the mosquito, and is then in turn introduced into the body of another patient, to cause typical attacks of fever according to the type of parasite introduced. Occasionally two different parasites are introduced into the patient's body, and a mixture of the two forms of the disease results.

The commonest form of malarial fever (the so-called chills and fever, or ague) is due to the tertian and quartan parasites. In these, after an unknown period of incubation, probably from 36 hours to 15 days, the patient has a feeling as though he were going to be sick, sometimes with headache, sometimes a feeling of lassitude and a desire to yawn and to stretch. Occasionally the patient has nausea and vomiting. At the same time the temperature has begun to rise and a chill commences. He begins to shiver, the face becomes drawn, thin, and cold, the body shakes, the teeth chatter, and the skin may be cold and blue, although the internal temperature is known to be gradually rising. After from 10 to 15 minutes, or perhaps a longer time, the chill is followed by a hot stage. The coldness of the surface disappears, and the face becomes congested and flushed, the skin is red, the pulse is full, and the patient may have a throbbing headache, with mental excitement. Thirst is excessive. Then the period of sweating begins, the whole body being covered with perspiration; the temperature drops, the headache disappears, and in an hour or two the paroxysm is over.

A number of variations from this typical form are known. In the tertian type of fever the chill and fever usually occur every other day. This is due to the fact that the cycle of development of the tertian parasite is about 48 hours and that the stage of full development of the parasite, or sporulation, which is more or less coincident with the attack, occurs at these times. Thus every third day the patient has an attack, hence the term «tertian.» In the mixed infections, when two sets of parasites develop on alternate days, the paroxysms of chills, fever, and sweating may occur every day. In the quartan type of fever the cycle of development of the parasite is completed every fourth day. Mixed infections also occur in this form of the disease. In the northern United States these are the types of malaria which are more common, but below Mason and Dixon's line a much severer form of the disease is present. This is the æstivo-autumnal type, which gives rise to the so-called bilious remittent fevers and typho-malarial fevers of the South. In these the symptoms are extremely irregular. The paroxysms occur every 24 or 48 hours, and longer remissions are known. The length of the paroxysms is usually longer, lasting 20 hours, instead of 10 or •12 as in the tertian form; the onset of the disease is usually slow and gradual; and there may be no chill. Occasionally there is a continuous fever without much break, the temperature ranging from 102° to 103° F. Jaundice is not infrequent, and this, with the fever and a furred tongue and mental disturbance, often gives rise to the suspicion of typhoid fever. In the simpler types the patient may get well after ten days or two weeks without any special medication. The more severe forms may be fatal unless prompt diagnosis and medication are instituted. The diagnosis of malaria should always include an examination of the blood and the demonstration of the parasite. In the vast majority of untreated cases the parasite can be found. Occasionally, however, repeated examination fails to show it.

Treatment should be prophylactic as well as actual, and attention should be paid to the avoidance of infection no less than to care of the disease itself. Rigid protection of houses by means of screens to keep out the *Anopheles* is one of the most important procedures. Furthermore, it is highly essential that the mosquitoes themselves should be protected from the infection by screening all patients suffering from malarial fever. In order to do this the patient's couch should be surrounded by mosquito-netting, and all mosquitoes in the room of the malarial patient should be killed by means of pyrethrum-powder. Further measures for destroying malaria should be taken by draining off swamps and employing proper engineering methods in order to get rid of the mosquitoes themselves. The planting of swamps with leafy trees often dries them up, and thus prevents the formation of breeding places for mosquitoes. Finally the specific, quinine, should be used in all cases. It is a prompt and sure parasiticide, and in its varied forms can be used by almost every patient, despite individual idiosyncrasies.

In the consideration of some of the chronic forms of the disease a number of perplexing conditions are met. Thus, following constant exposure to malaria and repeated attacks of the disease, symptoms of anæmia, of breathless-the Indian Archipelago and East Asia, and Ethnology of the Indian Archipelago'; Wallace, 'The Malay Archipelago.'

Malbaie, Canada. See MURRAY BAY.

Malbone, măl-bōn', **Edward Greene,** American painter: b. Newport, R. I., August 1777; d. Savannah, Ga., 7 May 1807. As a boy he was in the habit of frequenting the theatre at Newport to watch the painting of the scenes. At that early age he executed an entire scene, a landscape for the stage, the success of which encouraged him to devote his attention exclusively to painting. At 17 he established himself in Providence as a portrait painter. Meeting with success, he removed in 1796 to Boston, and during the next four years pursued his art in various cities. In 1800 he accompanied Washington Allston (q.v.) to Charleston, and in the succeeding year the two young artists sailed for Europe. Malbone when in London was urged by Benjamin West to take up his permanent residence there with the prospect of ample professional employment; but he returned to Charleston in December 1801. For several years he painted miniatures in the chief cities of the United States with great reputation. His principal imaginative work is 'The Hours,' in which the divisions of the day are personified by female figures.

Malbrouk, măl-brŭk', a yellowish, grizzled monkey of West Africa (*Cercopithecus cynosurus*), distinguished from other species of the genus (called guenons) by its wide flesh-colored face with a band across the forehead, the bristly whiskers and ventral parts white.

Malcolm, măl'kŏm or mâ'kŏm, the name of four Scottish kings: MALCOLM I., reigned from 943 to 954, and during this period occurred the cession of Cumbria to the Scots by Edmund I., the English sovereign. MALCOLM II. (d. Glams 1034), succeeded Kenneth II. in 1005 and in his reign Lothian and Strathclyde were secured to Scotland. MALCOLM III., surnamed Canmore (Great Head); b. about 1024; d. near Alnwick, Northumberland, 13 Nov. 1093. After the murder of his father, Duncan, by Macbeth, he was assisted by Siward of Northumbria, and Edward, the Confessor. After the death of Macbeth he was crowned at Scone in 1058. In 1068 he granted asylum to Edgar Atheling, his mother, and two sisters (one of whom, Margaret, he married in 1070), with a number of Saxon exiles. His reign, though largely concerned in warring with England, had nevertheless an important bearing on the civilization and consolidation of Scotland. MALCOLM IV. (the Maiden), d. Jedburgh 9 Dec. 1165, succeeded his grandfather, David I., in 1153. He suppressed two rebellions in his realm, and surrendered Northumberland and Cumberland to Henry II. in 1157.

Malcolm, SIR **John,** British soldier and diplomatist: b. Burnfoot, Dumfriesshire 2 May 1769; d. Windsor, England, 31 May 1833. He entered in 1782 the service of the East India Company, in 1797 was made captain, and till 1799 was engaged in various important services, terminating at the fall of Seringapatam. He was three times ambassador to Persia, and in 1822 was made major-general, and received a grant of £1,000 per year from the East India Company. He was governor of Bombay, 1827–31, when he finally returned to Britain. He was knighted in 1812. His principal works are: 'A Sketch of the Sikhs'; 'The History of Persia' (1815); 'Sketches of Persia'; 'A Memoir of Central India'; a treatise on the Administration of British India (1823); 'Life of Lord Clive' (1836). Consult Kaye, 'Life and Correspondence of Major-General Sir John Malcolm' (1856–7).

Malczewski, mäl-chĕv'skē, **Antoni,** Polish poet: b. Warsaw, Poland, 3 June 1793; d. there 2 May 1826. He entered the Polish army in 1811, but resigned in 1816 and traveled on the continent, where he met Byron. He settled in Warsaw and there wrote 'Marja' (1825), an epic poem which after his death was recognized as a literary work of great merit, and has since been translated into several languages. None of his work brought him fame or recognition during his life, and he died in wretched poverty. A tomb «To the author of Marja» was erected in Varsovia.

Malden, mâl'dĕn, Mass., city, in Middlesex County; on the Malden River, and on the Boston & Maine railroad; about four miles north of Boston. It is connected by electrical railway with Boston, Lowell, Haverhill, Lynn, Salem, and a number of other cities and towns. Malden includes several villages.

The first settlement was made in 1641, but the place remained a part of Charlestown until 1649, when it was made a separate, incorporated municipality. It was chartered as a city in 1881. It is a manufacturing city, having over 630 manufacturing establishments, representing nearly 50 different industries. The chief products are rubber boots and shoes, boot and shoe lasts, and boot-trees, wire cord, leather, sand and emery paper, cotton goods, fibre goods, hosiery and hosiery supporters, knit goods, furniture, soap, and picture molding. The manufactories have a combined capital of nearly $8,000,000, and the annual output is nearly $17,000,000. The number of employees is about 5,000. The municipal expenditures are annually about $602,000; the principal items of which are for schools, $155,000; for waterworks, $45,000; for charities, $40,000; for fire department, $35,000; police, $30,000; for municipal lighting, $30,000. The Metropolitan District water system supplies water to the city, also to Melrose and Medford. Malden has excellent public and parish schools, a number of fine church buildings, a Y. M. C. A. building, four libraries, which contain about 33,000 volumes, a Home for the Aged, and a city hospital. The Converse Library building, designed by Richardson, is beautiful and commodious. The government is vested in a mayor and a council. The executive appoints, subject to the approval of the council, the administrative officials. Pop. (1890) 23,031; (1900) 33,664.

Maldive mal'dīv) **Islands** (Thousand Isles), Indian Ocean, a chain of islands at the entrance to the Arabian Sea, 500 miles west of Ceylon, extending from lat. 0° 40' S. to 7° 6' N., nearly on the meridian of 73° 30' E., with a breadth of about 50 miles. The chain is composed of 17 coral atolls (see ATOLL), the larger islands richly clothed with wood, chiefly palm, fertile in fruit, and in various kinds of edible roots. They also produce millet, and abound in cocoanuts, fowls, and all descriptions of fish. The inhabitants are a civilized race of people of mixed Singhalese and Arab extraction, Mohammedans and speaking a dialect closely allied to the Ceylonese. They carry on a considerable trade with Bengal, Ceylon, and the Malabar coast, as also to the Red Sea and to Sumatra; exchanging cowries, which are plentiful in the Maldives, coir, mats, oil, fish, tortoise-shell, etc., for rice, sugar, tobacco, and manufactured goods. They are expert navigators and sailors, and have schools for teaching navigation on some of the islands; and they make and repair nautical instruments. They are governed by a sultan, whose title and rank are hereditary; he resides in the island of Mali and pays annual tribute to the British government in Ceylon. Pop. about 30,000.

Male Fern. See Ferns and Fern-allies.

Male Preponderance. See Prepotency.

Malebranche, Nicholas, French philosopher: b. Paris 6 Aug. 1638; d. there 13 Oct. 1715. He studied philosophy in the Collège de la Marche, theology in the Sorbonne and entered the congregation of the Oratorians in 1660. In the history of French metaphysical speculation he ranks second only to Descartes, the greatest of French thinkers, and in 1699 was made member of the Academy of Sciences. He was induced to give many years' study to the Cartesian philosophy by the perusal in 1664 of the treatise 'De Homine' by Descartes, and the fruit of his investigations appeared in his brilliant and original works, 'De la Recherche de la Vérité' (1674), and 'Traité de l'Imagination.' The essence of his philosophy is a sort of mystical idealism. According to him, we have cognizance of things, as well objective realities, as subjective thoughts and feelings, through the idea which resides in our souls; but this idea is in God, so that we perceive everything in God (*vision en Dieu*) as the primal cause of all existences and things. Hence the famous doctrine of 'Occasionalism' or 'Interference,' in accordance with which the objective thing and the subjective impression are made on every occasion to coincide, by the direct interposition of God, in whom alone we think and feel. In the history of philosophy Malebranche may be styled the connecting link between Descartes and Spinoza, the difference between his philosophy and that of the pantheist Spinoza consisting in the fact that to him the Universe was in God, and to Spinoza God was, in fact, in the Universe. Among his other works are to be mentioned 'Conversations Chrétiennes' (1676); 'Traité de la Nature et de la Grace' (1680); 'Traité de la Morale' (1684); 'Entretiens sur la Metaphysique et la Religion' (1688); 'Entretiens d'un Philosophe Chrétien et d'un Philosophe Chinois sur l'Existence et la Nature de Dieu' (1708). Consult: Blampignon, 'Etude sur Malebranche' (1861); Ollé-Laprune, 'La Philosophie de Malebranche' (1870); André, 'La Vie du Révérend Père Malebranche' (1886); Farny, 'Etude sur la Morale de Malebranche' (1886).

Malesherbes, Chrétien Guillaume de Lamoignon de, krā-tē-ăṅ gē-yōm dė lä-moin-ōṅ dė mäl-ĕs-ărb, French statesman: b. Paris 6 Dec. 1721; d. there 22 April 1794. He was educated at the Jesuits' College, entered the legal profession and in 1745 became counsellor of the Parliament of France; in 1750 he was president of the Court of Aids. He was broad-minded and liberal in his policy, favoring the publication of the 'Encyclopédie' and owing to his protestation against different measures of Louis XV. was removed from office. Under Louis XVI. he was minister of the interior, but resigned in 1776 and until the Revolution spent his time upon his estates and in travel, with the exception of 1787–8, when he was again minister. At the outbreak of the Revolution he came loyally to the assistance of Louis XVI. and was leading counsel in his defense. He remained with the monarch until almost the last and 11 months later was guillotined for treason. He was the author of essays and pamphlets on financial questions, etc.

Malet, Claude François de, klōd frāṅ-swä dė mä-lā, French conspirator: b. Dôle, Franche-Comté, France, 28 June 1754; d. Paris 29 Oct. 1812. He entered the army in 1771 and became a brigadier-general in 1799. Suspected of conspiracy against Napoleon, he was dismissed from the army in 1807 and confined in La Force. While there he laid new plots and was thenceforward confined in a state prison from 1808 till 1812. During Napoleon's campaign in Russia Malet made his escape from prison on the night of 22–3 October, and by circulating the false news of Napoleon's death won over some of the National Guards. While the latter secured the principal public offices in his name, Malet liberated his fellow conspirators, Generals Guidal and Lahorie, from prison. He was, however, himself taken prisoner by Laborde, chief of the military police of Paris, and was shot with his fellow conspirators.

Malet, Lucas. See Harrison, Mary Saint Leger.

Malherbe, François de, frāṅ-swä dė mäl-ărb, French poet: b. Caen, France, 1555; d. Paris 16 Oct. 1628. He was educated in Heidelberg and was engaged in the wars of the League. In 1605 he became court poet under Henry IV., but his work as a critic was of greater value than his poetry, which was lacking in poetic feeling and originality, though metrically perfect. He was the founder of the French school of classicism and must be credited with arousing a critical sense among the thinkers of France. His works consist of translations from the Latin and one volume of original verse. Consult: Allais, 'Malherbe et la Poésie française à la fin du XVI. Siècle' (1892); Brunot, 'La Doctrine de Malherbe' (1891).

Malibran, Maria Felicita, mezzo-soprano singer: b. Paris 1808; d. Manchester, England, 1836. She was early trained for the operatic stage by her father Manuel Garcia (q.v.), the Spanish tenor, and made her debut in London (1825). She had lived in that city since 1817 as a teacher of singing, and her success in Rossini's 'Barber of Seville' was such that she was induced to follow her father to New York, where he had an engagement to establish grand opera. Here she married a French merchant named Malibran. She returned to the stage on her husband's failure in business, and in the spring of 1828 appeared on the Parisian boards in Rossini's 'Semiramis.' She subsequently was welcomed with great enthusiasm in London, Naples, Vienna, Milan, and Venice, and traveled with the violinist de Bériot, whom she married shortly before her early death. She was a great actress as well as a marvellous songstress, and the irresistible charm of her person, added to the generosity of her mind and disposition, made her during her brief career one of the most fascinating operatic singers that had ever won the applause of the European public. In 1838 a statue was erected to her in Brussels, which had been her last place of residence. Consult: Nathan, ‘Life of Madame Maria Malibran de Bériot’ (1846).

Malic Acid, an organic acid discovered in 1785 by Scheele, and now known to be widely diffused throughout the vegetable kingdom, occurring sometimes in the free state, and sometimes in the form of its potassium, magnesium, or calcium salts. It occurs abundantly, for example, in the gooseberry, cherry, strawberry, and barberry, and also in unripe apples, from which latter fact it derives its name (Latin *malum,* an apple). It may be conveniently prepared by boiling the juice of mountain ashberries with enough milk of lime to almost neutralize it, and pouring the precipitate into boiling dilute nitric acid. Acid malate of calcium crystallizes from the nitric acid upon cooling, and this is dissolved in water, and precipitated by acetate of lead, the lead malate that is thrown down being subsequently decomposed by sulphuretted hydrogen gas. Malic acid has the formula $C_4H_6O_5$, or $C_2H_3(OH).(COOH)_2$, is dibasic, and can be obtained in the form of colorless prisms or needles, which are hygroscopic, and dissolve readily in water and in alcohol. Malic acid kills algæ, and when present in a solution in any considerable amount it prevents the precipitation of cupric and ferric salts by the alkalies. With bases it forms compounds known as «malates,» which are mostly soluble.

Malice, in law, a premeditated or formed design to do mischief or injury to another, called also «malice prepense» or «aforethought.» Blackstone says that malice prepense is not so properly spite or malevolence to the deceased in particular, as any evil design in general; the dictate of a wicked, depraved, and malignant heart; and it may be either express or implied in law. Express malice is when one, with a sedate deliberate mind and formed design, doth kill another. In many cases where no malice is expressed, the law will imply it; as where a man wilfully poisons another; in such a deliberate act the law presumes malice, though no particular enmity can be proved.

Malicious Mischief, in law any injury done to the person or property of another with deliberate malice. This is an indictable offense both in Great Britain and the United States. The comprehensive English Black Act (so-called from its preamble that «several ill-designing and disorderly persons have of late associated themselves under the name of blacks») with others of a like kind were in 1861 codified (24 and 25 Vic., ch. 97) into an act which extends malicious mischief to buildings, fish ponds and other real estate, as well as to most classes of personal property. To constitute this offense, real not merely legal malice must be proved, such as is defined by Blackstone, «a spirit of wanton cruelty or black and diabolical revenge»; or, as defined by the supreme court of Massachusetts, «a spirit of cruelty, hostility or revenge.» This spirit must be cherished by the offender not against a third party, but against the party whose person or property has been injured. Some States of the Union make secrecy a necessary element in the offense, others generalize the offense as implying merely the infliction of unlawful injury. If the injury was inflicted in the discharge of official duty, or under an honest sense of justification, this is sufficient defense to secure acquittal. The offense may be either a misdemeanor (q.v.) or a felony (q.v.) according to its circumstances. Consult: McClain, ‘Treatise on Criminal Law, as Now Administered in the United States’ (1897); and Harris, ‘Principles of the Criminal Law.’

Malicious Prosecution, prosecution of a person unsuccessfully, maliciously and without cause. To constitute this offense it must be proved (1) That the prosecution averred to be malicious was instituted by the defendant named. (2) That it was decided against prosecutor. (3) That the suit was without probable cause. (4) That the motive was malice. (5) That the plaintiff was injured by such malicious prosecution.

Quod facit per alium facit per se is fully applicable to the defendant in a suit for malicious prosecution; hence a corporation may be liable though they acted through their agent. (See Tort.) Consult: Newell, ‘Malicious Prosecution, False Imprisonment, and Abuse of Process’ (1892).

Maligi, mä-lē-hē′, Philippines, an island lying southeast of Talim Island in the Bay Lagoon (q.v.); it is the seat of the United States military prisons.

Malig′nant Pustule. See Anthrax.

Malig′nants, in English history, a name applied in 1643 by members of Parliament to designate those whom they considered to be the evil advisers of Charles I. Afterward the name was extended to all who sided with the king against the Parliament.

Malinao, mä-lē′now, Philippines, (1) a pueblo of the province of Albay, Luzon, situated on the Lagonoy Gulf, 18 miles north by west of Albay, the provincial capital, and three miles north of Tabaco. It is on the main road, and is the shipping point for the large hemp product of the surrounding region. Pop. 11,800. (2) A pueblo and military station of the province of Capiz, Panay, on the Akdón River, 6 miles from its mouth, 30 miles west of Capiz. Pop. 5,800.

Malines, mä-lēn. See Mechlin.

Malingering, mä-lĭng′gär-ĭng, a term denoting feigning disease on the part of a soldier, sailor, prisoner, etc., in order to obtain discharge from service, or escape from duty or labor. It implies some overt act, such as the previous application of a ligature, or the taking of some drug, which produced the appearance of the disease said to exist. A worse form of the same crime, «wilfully maiming,» is erroneously called malingering.

Mall, mâl or mĕl, **The,** (1) a promenade in Central Park, New York, regarded as one of the most successful landscape effects in this country. (2) An avenue in London, on the north of Saint James Park.

Mallalieu, măl-lạ-lū′, **Willard Francis,** American Methodist bishop: b. Sutton, Mass., 11 Dec. 1828. He was graduated from Wesleyan University in 1857 and became a Methodist Episcopal clergyman in 1858. He has held many important charges and in 1872, 1876, 1880, and 1884 was a member of the general conferences. He was presiding elder of the district of Boston in 1882–4 and in 1884 was elected bishop.

Mal'lard. See DUCK.

Mallarmé, Stéphane, stā-fän mäl-är-mā, French poet: b. Paris March 1842; d. there 9 Sept. 1898. Most of his life was passed as an instructor in English at the Lycée Fontanes of Paris. He is known as the founder of the curious poetic school of the «Décadents,» in whose organ, 'Le Décadent,' as well as in 'Le Parnasse Contemporain,' he published much. Incomprehensibility appears to have been the object of his study, and he entirely attained it in his preface to an edition (1880) of Beckford's 'Vathek.' Others of his works are 'L'Après-Midi d'un Faune' (1876); 'Petite Mythologie' (1878); 'Les Dieux antiques' (1880); 'Poésies' (1887), a translation of Poe's poems (1888), perhaps his most satisfactory performance; and 'Vers et Prose' (1893).

Mal'leabil'ity, in metallurgy, the property of extending under the blow of a hammer. For every metal there is a temperature of greatest malleability. The following is the order of malleability of the metals: Gold, silver, copper, platinum, iron, aluminum, tin, zinc, lead.

Mal'leable Glass. See GLASS, MALLEABLE.

Malleco, mäl-yā'kō, Chile, a province bounded by Argentina, Cautin, Bio-bio, and Arauco. It has an area of 2,857 square miles. The capital city is Angol. The province is mountainous and well wooded in the eastern and western parts. About one half of the population is composed of Indians of the Arauco tribe. Wheat is the staple agricultural product of the country. A portion of the province is traversed by two railway lines running north and south. Pop. (1885) 59,492; (1895) 97,320; (1902) 102,400.

Mal'lee-bird, or **Maleo,** a name for the Australian mound-bird (q.v.), derived from a native language.

Mal'lery, Garrick, American ethnologist: b. Wilkesbarre, Pa., 23 April 1831; d. Washington, D. C., 24 Oct. 1894. He was graduated from Yale College in 1850 and was admitted to the bar in 1853; he practised law in Philadelphia until 1861, when he enlisted and served through the war in the Federal army, attaining the rank of lieutenant-colonel. He was executive officer of the Signal Service Bureau until 1876, when he was engaged in a geological survey in Dakota, and in 1879 was retired from the army and appointed chief of the bureau of ethnology. Among his books are: 'A Calendar of the Dakota Nation' (1877); 'Israelite and Indian, a Parallel in Planes of Culture' (1889); 'Greeting by Gesture' (1891); 'Picture Writing of the American Indians' (1893); etc.

Mal'leson, George Bruce, English historical writer: b. London 8 May 1825; d. there 28 Feb. 1898. He was educated at Winchester College, and from 1842 till 1877 served in India, at first in the army, and subsequently in government posts. His chief work, his 'History of the Indian Mutiny' (1878–80), which commenced where the 2d volume of Kaye's 'Sepoy War' left off, and in 1890 there appeared a joint edition of the two histories in six volumes, the 3d volume of Kaye's work being omitted and a new 6th one added. Other works by him are: 'The Mutiny of the Bengal Army' (1857); 'History of the French in India' (1868); 'Studies from Genoese History' (1875); 'Historical Sketch of the Native States of India' (1875); 'Final French Struggles in India and Indian Seas' (1878); 'History of Afghanistan' (1879); 'The Decisive Battles of India' (1883); 'The Battlefields of Germany' (1884); 'Ambushes and Surprises' (1885); 'The Indian Mutiny of 1857' (1890); and 'Refounding of the German Empire' (1892); lives of 'Clive' (1882), 'Marshal Loudon' (1884), 'Eugene of Savoy' (1888), 'Prince Metternich' (1888), 'Wellesley' (1888), 'Dupleix' (1890), 'Akbar' (1890), 'Warren Hastings' (1894), and 'Lakes and Rivers of Austria, Bavaria, and Hungary' (1897).

Mal'let, John William, American chemist: b. Dublin, Ireland, 10 Oct. 1832. He was educated at Trinity College, Dublin, and at Göttingen, and emigrating to the United States in 1853 became assistant professor in chemistry at Amherst 1854–6 and later chemist to the United States geological survey of Alabama. In 1856–60 he was professor of chemistry at the University of Alabama. He entered the service of the Confederacy and was paroled in 1865 as lieutenant-colonel of artillery. The chair of sciences at the University of Louisiana was occupied by him in 1865–8 and since 1868 he has been professor of chemistry in the University of Virginia. He has contributed valuable scientific articles to the leading chemical periodicals.

Mallet, a wooden hammer used in carpentry and also in the game of croquet (q.v.). The gavel (q.v.) is a variety of mallet. Various small mallets are used by gold beaters, jewelers, dentists and other artisans.

Mallian, mä-yän', **Julien de,** West Indian dramatist: b. Le Moule, Guadeloupe, 1805; d. Paris, France, 1851. He gained wide reputation as a writer of comedies and dramas, many of which have been presented on the metropolitan stage. The most popular are: 'Two Roses' (1831), a historical drama of the civil wars in England; 'The Carpenter' (1831), a comedy; and 'The Wandering Jew' (1834).

Mallock, William Hurrell, English author: b. Devonshire 1849. He was graduated from Balliol College, Oxford, and won the Newdegate prize in 1872. He has never entered a profession but has devoted himself entirely to literary work. His philosophical and sociological writings include: 'Is Life Worth Living?' (1879); 'Social Equality, a Study in a Missing Science' (1882); 'Atheism and the Value of Life' (1884); 'Property and Progress' (1884); 'Labour and the Popular Welfare' (1893); 'Studies of Contemporary Superstition' (1895); 'Classes and Masses' (1896); 'Aristocracy and Evolution' (1898); 'Doctrine and Doctrinal Disruption (1900); 'Religion as a Credible Doctrine' (1902). He has also written several works of fiction, most of which deal with the same social and religious problems as the above works, including 'The New Republic' (1877), in which he introduces many well-known contemporaries under thin disguises; 'A Romance of the Nineteenth Century' (1881; new edition 1894); 'The Old Order Changes' (1886); 'A Human Document' (1892); 'The Heart of Life' (1895); and 'The Individualist' (1899);

wo volumes of verse and a ·tius' 'On Life and Death' ophical works deal with the igion arguing for supernat- to show that science alone r religious belief; in his po- writings he has attacked ialistic theories and tenden-

name used for an extensive of feather-eating and hair- called lice. They are very , and of swift motion; of some with shovel-shaped horn-like appendages on the kind vexes the canary, glu- ners and in the cracks of its is a large form, a tenth of bristled head and shield-like the pests of domestic fowls. d with bands of yellow and urkey and the peacock. An- *Liotheidæ*, contains species ite ants, and prey upon the and of wading birds. *Gyro-* pigs, massing thickly about

en Russell, American law- W. I., 1813; d. Pensacola, His parents removed with States in 1820, and he was and in Nazareth, Pa. He vas admitted to the bar in d States Senator 1851–7 and service of the Confederate of a navy not in existence. t the close of the war and , after which he returned to until his death engaged in

us of herbs (*Malva*), of the The species, of which there re, are widely scattered, and y angled, lobed or dissected , or clustered axillary flow- four species cultivated in very well known weed, *M.* rly known among children because of the shape of the suggested another popular n plant." The plant is a rsistent of life, and rather te except by constant clean mallow (*M. moschata*), is large, showy pink or white is also popular. *M. crispa* bre, as probably other species o. Its leaves are often used are not eaten. This species e frequently seen in old gar- icinity as escaped plants, but sale by seedsmen. The name pplied to many species of the not of the genus *Malva;* for allow (*Althæa officinalis*), *cus moscheutos*), and Indian *vicennæ*); also, more loosely ants, as Jew's mallow (*Cor-* *C. capsularis*). See Abu- Hollyhock; Hibiscus.

ăl-mā-zôn, a celebrated the Seine, 10 miles west of vorite residence of Josephine, wife of Napoleon I., and here she died. The château belonged to Richelieu, and was in 1861 by Napoleon III. In 1870 a Ducrot from Paris was repulsed here Germans.

Malmesbury, mämz'bĕr-ĭ, **James,** 1st Earl of, English diplomatist: b. Sa England, 21 April 1746; d. London 20 N He was educated at Merton College, afterward studied at Leyden, and in came secretary of legation at Madrid, ambassador at Berlin 1772, in 1777 at burg, and in 1784 at The Hague. was created Baron, in 1800 Earl of M and viscount Fitz-Harris. In 1793, Whigs, he deserted Fox for Pitt, and had married by proxy and conducted the Princess Caroline. *Consult:* ' Correspondence' (1845); 'Lord Malmesbury and his Friends' (1870). (Both works by J. H. Harris, his grandson.)

Malmesbury, William of. See William of Malmesbury.

Malmignatte, măl-mĭ-nyăt', a spider. See Latrodectus.

Malmö, mäl'mė, Sweden, a seaport, the third largest town of the country, on the Sound, almost opposite Copenhagen, 17 miles distant, with which it has steam-ferry communication, a channel being maintained in winter by an ice-breaker. Malmö is a busy industrial centre with important manufactures, and is the terminus of several railroads, and is miles by rail southwest of Stockholm. The its harbor have been considerably improved and modernized, and an extensive export and import trade is carried on. Malmö dates from the 12th century. Pop. (1900) 60,857.

Malmsey, mäm'zĭ or mălm'sĭ, a sweet wine, made from a grape grown on rocky ground, in Madeira, exposed to the full influence of the sun, and not gathered until partially withered.

Malolos, mä-lō'lōs, Philippines, a pueblo and the capital of the province of Bulacan, Luzon, situated at the head of one of the inlets of the Pampanga River delta, five miles north-west of Bulacan, the former capital. It is a telegraph and military station, is near a station of the Manila Dagupan railroad, and is the centre of an important trade. It is in the region which was a stronghold of the insurgents, and immediately after the close of the Spanish war was made the capital of the insurgent government. Pop. 14,600.

Malone, ma-lōn', **Edmund,** English Shakespearian scholar: b. Dublin 4 Oct. 1741; d. London 25 April 1812. He was educated at Trinity College, Dublin, and was called to the Irish bar in 1767, but henceforth devoted himself entirely to literary pursuits. His most important and permanent critical works are: 'Attempt to Ascertain the Order in which the Plays of Shakespeare Were Written' (1778), which still carries authority; his edition of the poet in 10 volumes; and the edition known as the Third Variorum, which was published after his death by James Boswell, the younger, out of material left by the critic, and published in 21 volumes. This last is still the best of all complete critical editions. He also published: 'Remarks on the Rowley (Chatterton troversy’; ‘An Inquiry into the Ireland Shakespearian Forgeries’; and biographical memoirs of Sir Joshua Reynolds, Dryden, W. Gerard Hamilton, etc.

Malone, Walter, American verse writer: b. De Soto County, Miss., 10 Feb. 1866. He was graduated at the University of Mississippi, and subsequently engaged in the practice of law and in literary work. He has contributed to the periodicals of the day and has published: ‘Claribel, and Other Poems’ (1882); ‘The Coming of the King,’ short stories (1897); ‘Songs of the North and South’ (1900); etc.

Malone, N. Y., village, county-seat of Franklin County; on the Salmon River, and on the New York C. & H. R. and the Rutland R.R.'s; about 275 miles north by west of Albany, and 12 miles from the boundary between the United States and Canada. It is situated at the northern foot-hills of the Adirondack Mountains, in an agricultural region, the chief products of which are hops, hay, and potatoes. The dairy products and poultry are important.

The place was named in honor of Edmund Malone (q.v.), an Irish barrister and writer, by his friend, William Constable, who, together with his wife, named many of the places located within the limits of the large tract of land in the northern part of New York known as «The Macomb Purchase.» The first settlement was made in 1802, and its first inhabitants were mostly from Vermont and Ireland. In 1829–30 the people began considering the founding of an academy, and a number of the farmers pledged their farms as security for the payment of the debt incurred for the erection of the building, and Franklin Academy was established in 1831. The Northern railroad, now Rutland railroad, entered the town in 1851, and the New York Central in 1892.

Malone figured prominently in the War of 1812; and furnished a large number of soldiers, privates and officers, in the Civil War. The village was the scene of two Fenian (q.v.) gatherings.

The chief manufactures are paper, pulp, flour, lumber, leather, woolen goods, foundry and machine-shop products, sash doors, and blinds, men's clothing, cigars, and dairy products. The electric-light and gas plants and the waterworks are owned by private companies. Malone is the commercial centre for the greater part of Franklin and parts of the adjacent counties, a section having a population of about 50,000. There are two national banks capitalized for $300,000. The village has six fine churches, a high school building (formerly Franklin Academy), several grammar and primary schools, the county court-house, jail, a State Armory, and several wholesale establishments. The educational institutions, besides the public schools, are a State School for Deaf Mutes, and Saint Joseph's Academy. There are three public libraries, the Wead Library, 7,000 volumes, free to the people of the school district, is housed in a beautiful building donated by Mrs. S. C. Wead; the Wadhams Library, 2,000 volumes, established and maintained by a literary society, free to all the people of the town of Malone (several school districts), and the Franklin County Historical Society library, established in 1902. There is a well-kept park, the «Village green,» formerly the place of drill for the State militia. Malone was the home of William A. Wheeler, vice-president of the United States; John Larkin Thorndike, who built the Oroya and other railroads in Peru, S. A.; Ashbel P. Fitch, later of New York city, and a number of other noted people.

The government is vested in the president and board of trustees of the village under the general laws of the State of New York. The officers besides the president and six trustees are collector, treasurer, and police justice, all chosen by popular election, and the clerk and policemen who are appointed by the board of trustees. Since the Federal census of 1900 an adjoining manufacturing suburb has been incorporated in the village. Pop. (1890) 4,986; (1900) 5,935; (1903) 7,000.

Maloo Climber. See BAUHINIA.

Mal'ory, SIR Thomas, author of the English prose romance ‘Morte d'Arthur.’ The work was finished in the ninth year of Edward IV.'s reign, 1470, and published by Caxton in black-letter folio, in 1485. Little is known of the author; he may have been a priest; Caxton calls him «a servant of Jesus both day and night,» and priests frequently were accorded the title «Sir.» Probably he was a Welshman. See ARTHURIAN LEGENDS; MORTE D'ARTHUR; GRAIL, THE HOLY; LANCELOT; MERLIN; TRISTRAM.

Malot, mā-lō, **Hector,** French novelist: b. La Bouille, near Rouen, France, 20 May 1830. He studied law, but abandoned it for a literary career, and in 1859 issued the first of a long series of successful novels. He was for a time newspaper correspondent in London, and is literary critic of ‘L'Opinion nationale.’ Among his many books are: ‘Victimes d'Amour’ (1859); ‘Sans famille,’ published in English as ‘No Relations’ (1878); ‘Conscience’ (1888); ‘Complices’ (1893); an autobiography, ‘Le Roman de mes Romans’ (1896).

Malpighi, māl-pē'gē, **Marcello,** Italian anatomist: b. Crevalcuore, Italy, 10 March 1628; d. Rome 29 Nov. 1694. He received a medical education in Bologna and was granted a doctor's degree in 1653. In 1656 he became professor of medicine at Pisa, where he formed a friendship with the mathematician Borelli, who encouraged him to proceed with researches in anatomy. His health failing he returned to Bologna and continued his investigations, which resulted in discoveries which established facts undisputed in the modern world of science and placed the world's knowledge of physiology on a new footing; his researches in botany and entomology were highly important. In 1691 he was summoned to Rome as first physician to Innocent XII., in which office he died. He published numerous scientific works of great value, a complete edition of which was published in Venice 1743.

Malplaquet, māl-plā-kā, **Battle of,** the bloodiest in the war of the Spanish Succession, gained by Marlborough and Eugène, the commanders of the allies, against the French under Villars 11 Sept. 1709. The French lost 10,000; the allies more than 20,000.

Mälstrom. See MAELSTROM.

Malt and Malting. See BREWING AND MALTING.

Malt Refuse, Malt Sprouts. See NUTRITION OF FARM ANIMALS.

Malta, mâl'tạ, an island in the Mediterranean, belonging to Great Britain, with its dependencies, Gozo, Comino, and Cominetto, forming the elevated portions of the plateau that extends northwestward to Sicily, 62 miles, and southward to Africa, 197 miles, and divides the Mediterranean into two basins. The Maltese group has a total area of 117 square miles, of which 95 square miles belong to Malta. Malta is of irregular oval shape, 17 miles long, with a central breadth of 9 miles; its greatest elevation is over 750 feet. It is of limestone formation, and is deeply indented on all sides except the south, where the coast forms a continuous and almost unbroken line. Of great strategical importance, it is very strongly fortified, especially Valetta, the capital, which is the headquarters of the British Mediterranean fleet, and the principal naval and mercantile coaling station in the Mediterranean, importing and exporting annually between 500,000 and 600,000 tons. Malta is also a valuable sanatorium for troops employed in the Orient. The climate is hot in summer and enervating when under the influence of the humid sirocco blowing from Africa, but generally is mild and healthful. There are only a few small streams, but the springs are so numerous and copious that no deficiency of water is felt, and since 1880 an extensive system of waterworks has greatly enhanced sanitary conditions. Malta has a bare, stony appearance, owing to the absence of trees. The soil is thin, but remarkably fertile; and its fertility is increased by the skilful cultivation and the diligent toil of the inhabitants. Large crops of wheat and potatoes are raised, early varieties of the latter being largely exported to England; maize, barley, cotton, clover, oranges, figs, grapes, carob beans, and peaches and other fruits are also grown. Filigree ornaments and a little cotton are manufactured. Sheep and goats are kept, with smaller numbers of cattle, mules, asses, and horses. The language of the people is a corrupt dialect of Arabic, with a strong admixture of Italian and other words; some authorities, however, connect it with the ancient Phœnician. The native population believe themselves to be of Phœnician descent. From the time of the settlement of the Knights of St. John down to quite recently Italian was the official language; but it has been superseded by English. Most of the educated Maltese speak Italian, and some speak English; the peasantry as a rule know neither the one nor the other. The Maltese are a sober, industrious race of people, though often quick-tempered and ignorant. They are proud of their island home — they love to call it «the flower of the world» — and are devout Roman Catholics. Legislation is carried on by 6 official and 14 elected members, the British governor, with the power of veto, being president. There is also an executive council, consisting of the governor as president, seven official members, and three nominated by the governor from among the elected members of the legislative chamber; the crown retains the right to legislate also through orders in council. There is no direct taxation in Malta. The local militia, including the Royal Malta Fencible Artillery, number about 1,200. The population in 1901 was 188,141, including 2,300 British residents, 1,200 foreigners, and fro 6,000 to 7,000 imperial troops. Malta has gre historical, archæological, and architectural i terest. It passed successively through the han of Phœnicians, Greeks, and Carthaginians, a was finally attached to Rome during the Seco Punic War. Relics of these various occupations exist throughout the island. After the fall of the Roman empire it was seized at different times by Vandals, Goths, and Saracens. From the last it passed to Sicily, and followed its fortunes till 1522, when Charles V. granted it to the order of St. John of Jerusalem, the Knights of St. John of Malta being distinguished during successive centuries for their bold defense of Christianity against Moslem assaults. In 1798 the grand-master surrendered Valetta without defense to Napoleon. Shortly afterward the inhabitants regained it and asked for a British protectorate, which was confirmed in 1814 by the Congress of Vienna. Consult: Ballou, ‹The Story of Malta› (1893).

Malta Fever (also MEDITERRANEAN FEVER, NEAPOLITAN FEVER, ROCK FEVER, etc.), a disease occurring near the Mediterranean shores, in which the fever symptoms are accompanied by intense pain, enlargement of the spleen, swelling of the joints, excessive perspiration, and other conditions tending to bring about extreme weakness and loss of functional activity. Its cause is now assigned to *Micrococcus melitensis*. Treatment thus far is not specifically determined. Hygienic care, such as is normal in fevers, with special attention to diet and bathing, together with ordinary applications for reducing swellings, is all that can be recommended.

Malta, Knights of. See KNIGHTS OF MALTA.

Maltbie, mâlt'bĭ, **Milo Roy**, American sociologist: b. Hinckley, Ill., 3 April 1871. He was graduated from Upper Iowa University in 1892 and took the degree of Ph.D. at Columbia in 1897. He was professor of economics and mathematics at Mount Morris College, Ill., in 1893–5, and from 1897–1902 was secretary of the Reform Club Committee on City Affairs, and has devoted himself to the study of municipal questions, going abroad in 1899 to investigate foreign cities and their problems. He was lecturer on municipal government at Columbia University in 1900, and has been editor of ‹Municipal Affairs› since 1897. He has written: ‹English Local Government of To-Day› (1897); ‹Municipal Functions› (1898); and ‹Street Railways of Chicago› (1901).

Malte-Brun, mäl'tĕ-broon (Fr. mält-brün), **Conrad** (properly MALTHE BRUNN), Danish geographer: b. Thisted, Jutland, 12 Aug. 1775; d. Paris 14 Dec. 1826. He devoted himself to literature and politics in Copenhagen, but having given offense by writing in favor of the liberty of the press and the enfranchisement of the peasants, was banished to Sweden in 1796. He went later to Paris, where he became famous as a geographer. He edited the foreign political department of the ‹Journal des Debats,› but is best known for his ‹Summary of Universal Geography› (8 vols., 1810–29). The first six volumes only were completed by Malte-Brun. Among his other works are: ‹Ancient and Modern Poland›; ‹History of Travel›; and ‹Mathematical, Physical and Political Geography.›

Maltese (mâl-tēs' or -tēz') **Cross.** See Cross.

Maltese Dog. See Dog.

Mal'tha, (1) according to Pliny, a name used for an inflammable mud which flowed from a pool at Samosata, Commagene, North Syria, and resembled naphtha. (2) A mixture of wax and pitch for caulking ships; mineral tar is another name for maltha, which is found oozing from rocks in certain localities, particularly in California.

Mal'thus, Thomas Robert, English political economist: b. near Dorking, Surrey, 14 Feb. 1766; d. Bath 29 Dec. 1834. He studied theology at Cambridge and was ordained in the Church of England, continuing to pursue his profession as a teacher while holding a small living in Surrey. In 1805 he was appointed professor of history and political economy at Haileybury College. In his famous ‘Essay on the Principles of Population’ he propounded (1798) what is known as the Malthusian Doctrine, namely that the increase of population advances at a geometrical, the increase of the means of life at an arithmetical ratio: that this condition of things renders the condition of the poor more and more hopeless, that unless famine or war interfere to diminish population the means of life will eventually prove inadequate; that discouragement of early and improvident marriages and the cultivation of self-restraint must be employed to avert the danger. These positions have been the subject of long and widespread discussion. His other writings include: ‘Principles of Political Economy’ (1826); ‘Definitions in Political Economy’ (1853). Consult: Bonar, ‘Malthus and His Work’ (1885); Soetbeer, ‘Die Stellung der Sozialisten zur malthusischen Bevölkerungslehre’ (1886); Molinari, ‘Malthus, Essai sur le Principe de Population’ (1889); Cossa, ‘Il principio di populazion di T. R. Malthus’ (1895).

Malus, Etienne Louis, ā-tē-ĕn loo-ē mā-lüs, French physicist and military engineer: b. Paris 23 June 1775; d. there 23 Feb. 1812. He was educated at the Ecole Polytechnique, and upon leaving the school received a captain's commission in the corps of engineers, and served during the campaign of 1797 with the army of the Sambre and Meuse. Subsequently he participated in the campaign in Egypt, and in 1804 superintended the construction of fortifications at Antwerp and Strasburg. Whatever time could be spared from his professional labors was devoted to scientific pursuits. His chief publications consist of a mathematical ‘Traité d'Optique,’ first published in the ‘Mémoires présentés à l'Institut’ in 1810, in which he promulgated some valuable discoveries respecting the refraction of light in transparent media; and the ‘Theory of Double Refraction’ (Mémoires présentés a l'Institut, Vol. II.), containing an account of his discoveries respecting the polarization of light, which consisted in showing that light may acquire properties identical with either of two rays yielded by refraction through Iceland spar by the process of simple reflection at a particular angle from any transparent body. This discovery gained for its author his election to the Institute and the biennial medal of the Royal Society of London. He also published an ‘Essay on the Measurement of the Refractive Force of Opaque Bodies.’

Malvaceæ, a family of flowering plants, the mallows and their allies, in the order *Columniferæ,* with the calyx gamosepalous; petals contorted in the bud, stamens numerous, monadelphous; anthers extrorse, monothecious; pollen-grains spiny. They are herbaceous or woody plants, mucilaginous in their juices, and usually densely hairy, especially when young. The leaves are palmately nerved and frequently deeply five-lobed. The flowers are large, funnel-shaped, conspicuously and beautifully colored, attracting the aid of insects in fertilization. The fruit is schizocarpous. This family contains many important genera and species of plants elsewhere described, such as the mallows (*Malva, Lavatera,* etc.), hollyhocks (*Althæa*), cotton-plants (*Gossypium*), the rose-mallows (*Hibiscus*), etc. About 60 genera and 700 species are accredited to this family by systematic botanists.

Malvern, măl'vèrn, Ark., town, county-seat of Hot Springs County; on the St. Louis, I. M. & S. railroad; about 20 miles southeast of Hot Springs. It is in an agricultural region, in which the principal products are cotton and fruit. The chief manufactures are flour, lumber, and bricks. The trade is principally in lumber, cotton, and fruits. Pop. (1900) 1,582.

Malvern, mâl'vèrn, **Great,** England, a fashionable inland watering-place in Worcestershire, on the east side of the Malvern Hills, at the foot of the Worcestershire Beacon, 1,395 feet high, the summit of which commands magnificent views. A restored 11th century priory church and Malvern College are the chief edifices. Malvern is widely celebrated and greatly frequented owing to its fine climate and the efficacy of its mineral springs. Pop. (1901) 16,400.

Malvern Hill, Battle of. After the close of the battle of Glendale (q.v.), 30 June 1862, the Army of the Potomac was put in position on Malvern Hill, an elevated open plateau on the left bank of James River, 60 feet high, and about 1½ miles by ½ mile in area. On this plateau the army was disposed in a large arc, both flanks resting on the river, and protected by gunboats. Porter's Fifth corps was on the left, Couch's division of Keyes' corps on the right of Porter, Heintzelman's two divisions — Kearny and Hooker — on the right of Couch, Sumner's corps on the right of Heintzelman, and Franklin's corps on the right of Sumner. Peck's division of Keyes' corps was on the right of Franklin and was the extreme right of the army, and it and the left of Porter's line stood back to back. There were numerous batteries of artillery along and in rear of the line. The position was a very strong one: the Confederate D. H. Hill says: «Tier after tier of batteries were grimly visible on the plateau rising in the form of an amphitheatre.» The approach to the position was over 400 to 500 yards of open ground swept by artillery fire. When it was discovered early in the morning of 1 July that McClellan had fallen back from Glendale during the night, Lee gave orders for immediate pursuit. Jackson marched by the Willis road, and when in sight of Malvern Hill he formed line, with Whiting's division on his left and D. H. Hill's on his right, one of Ewell's brigades occupying the interval. The rest of Ewell's division and Jackson's own division were held in reserve. Magruder was directed to take position on Jackson's right, but before his arrival two of Huger's brigades came up and were placed next to Hill. The Confederates felt the Union lines with infantry and artillery, and when Magruder came up, about 2 P.M., Huger's two brigades — Armistead and Wright — with four batteries, were ordered forward. The batteries, as they emerged in succession from the woods, were promptly knocked to pieces by the fire of over 60 guns brought to bear upon them, and the two brigades were repulsed with loss. This attack fell upon the right of Porter and left of Couch, and the latter was now reinforced by Caldwell's brigade of Sumner's corps. No serious advance had been made on other parts of the line, but Hill had suffered severely from artillery fire in getting his troops in position opposite Couch's right. At 5:30 P.M. Magruder assaulted Porter's line and the left of Couch with the five brigades of Armistead, Cobb, Wright, Mahone, and Barksdale. All were met by such a terrific fire of artillery and musketry, which swept the slope of the hill, that they could make no headway, though gaining temporary advantages, and fell back with great loss. Toombs', G. T. Anderson's, and Ransom's brigades were now ordered in; Toombs got lost in the thick woods; Anderson and Ransom shared the fate of those preceding them, and fell back. Magruder's fight ended before dark. While Magruder was thus engaged with Porter and the left of Couch, D. H. Hill, on his left, advanced against Couch's right, which, as the action progressed, was reinforced by Caldwell's brigade, three regiments of Hooker's division, under Sickles, and some of Kearny's division. Hill's five brigades were commanded by Gens. Garland and Ripley, and Cols. J. B. Gordon, A. H. Colquitt, and C. C. Tew. The slope to Couch's line was about 800 yards, without cover, and the advance directly in the face of guns on the slope and bristling on the summit, from which burst forth such a terrific fire of shell and canister that Hill's brigades withered under it. Toombs' brigade was picked up and sent to their support, but the six brigades were hurled back, some in great disorder after the loss of half their men. Later in the evening Taylor's brigade of Ewell's division, on Hill's left, moved against the left of Kearny's division, and was repulsed by artillery fire alone. Half an hour after Hill had been disastrously repulsed and his troops scattered, McLaw's division of two brigades — Semmes and Kershaw — came up and assaulted Porter's right. Semmes made some headway up the slope, but was met by the 69th and 88th New York of Meagher's brigade, which Sumner had sent to Porter's assistance, and was repulsed after a hand-to-hand encounter. Kershaw, on Semmes' left, was likewise repulsed, and his repulse at twilight marked the close of the battle, but it was 9 o'clock before the firing ceased and quiet settled down on the bloody field. Sixteen Confederate brigades had heroically thrown themselves against the Union left, but were repulsed by the artillery and nine brigades. Advanced regiments were forced back, but generally recovered ground; batteries or parts of batteries were withdrawn, but again run forward; yet «never for an instant was the Union line broken or the guns in danger.» The Confederate loss was over 5,500; Jackson's four divisions had 2,301 killed, wounded, and missing; Ma-

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Egypt continued 263 years. During this period they made some important conquests, and in 1291 they drove the Franks entirely out of the East. From the middle of the 18th century the number and wealth of the Mamelukes gave them such a superiority over the Turks in Egypt that the pasha appointed by the Porte was obliged to conform entirely to their wishes. This superiority was owing principally to Ali Bey, who ruled with unlimited power from 1766 to 1773, when he was assassinated. The Mameluke beys, especially Murad Bey, played an important part at the time of the French invasion. The Mamelukes, who were scattered throughout Egypt, and estimated at 10,000 or 12,000 men, maintained their numbers, principally by slaves brought to Cairo from the regions lying between the Black and Caspian seas. These were compelled to embrace the Mohammedan faith, and were all educated as soldiers. After a time they obtained a share in the government, and some of them even became beys, for none but Mamelukes were capable of holding this office. They formed a fine body of cavalry, and attacked the French, when they landed in Egypt, with the greatest fury; but they were unable to withstand the European artillery, and many of them soon joined the French. The Pasha of Egypt, Mehemet Ali, destroyed the Mameluke beys 1 March 1811, by a perfidious stratagem, and immediately afterward ordered a general massacre of the Mamelukes in every province of Egypt. Some hundreds managed to escape into Lower Nubia, where they built a small town, and endeavored to keep up their force by disciplining negroes in their peculiar tactics. They did not succeed, however, and shortly afterward dispersed. See also EGYPT.

Mammalia. See MAMMALS.

Mammals, a class of animals, known also as beasts, or quadrupeds, the highest of the vertebrate group in the sense that it comprises forms whose organization is on the whole the most efficient on account of the complexity, or perfection, of the various organs and parts. The diagnostic character of the class is the possession of cutaneous glands, which secrete a complex fluid, called milk, for the nourishment of the young. The lower jaw articulates directly with the cranium. The occipital condyles, two in number, form part of the exoccipitals. The internal ear contains a series of three or four separate small bones, which are concerned in audition. The heart is four-chambered, with two auricles and two ventricles; a single left aortic arch; blood warm; red blood disks, not nucleated. A muscular diaphragm separates the heart and lungs from the abdominal cavity. With few exceptions, mammals are clothed with hair, a special outgrowth of the epidermis.

Mammals as a class are extremely diversified in size, appearance and habits. The structure of some is modified for a purely aquatic life, of others for burrowing in the earth, for flying, for leaping, for running, etc. Some live entirely in the sea, others pass their lives in the treetops, and others in subterranean caverns, which they excavate.

All mammals possess limbs, which are normally four in number, but the hind pair is suppressed in the whales and sea-cows. The limbs assume the form of legs for terrestrial progression, wings for flight, or paddles for swimming. The class includes man, and the majority of the animals most useful to man, such as the horse, ox, sheep, goat, dog, cat, etc. It includes also the whales, the largest of existing animals. About 600 genera and 5,000 species of mammals (exclusive of fossil forms) are known, of which about 200 genera and 1,200 species occur in North America, north of Panama.

Integuments.—The skin of mammals consists of two principal layers, a superficial one, called the epidermis or cuticle, and a deeper layer, the dermis or corium. The epidermis is again divided into two layers, an external horny layer and a deeper one, called the Malpighian layer. The epidermis is usually quite smooth, and is beset with hairs which are a special outgrowth of this part of the integument peculiar to the class. The cetacea are without hairs, except a few about the mouth. In the pangolins, the epidermis develops large scales which cover the greater part of the body. Epidermic scales of smaller size are found on the tails of various rodents, insectivores, and marsupials. The horns of ruminants, the nasal horn of the rhinoceros, and all claws, nails, and hoofs are also epidermic structures.

The dermis or corium is generally thicker than the epidermis and contains blood-vessels, tactile nerve endings, sweat glands which open on the surface of the body, and fatty tissue. In the whales and seals the fat cells are enormously developed immediately below the dermis and constitute the «blubber.» In the armadillos bony plates occur in the dermis, forming a carapace or shell. They are covered by horny sheaths. The presence of small hard tubercles in the skin of certain porpoises gives ground for the belief that the ancestors of the cetacea were covered with a bony armor, somewhat like that of the armadillos.

Hair.—True hairs are found only on mammals. They are simple epidermic structures growing from papillæ sunk in the dermis. They consist of central cellular pith, encased in a horny sheath. In some mammals the sheath is rough, and the hair is then capable of being matted together to form «felt.» In the majority of mammals the hairy covering consists of coarse long hairs and fine short hairs intermingled, forming the fur. In the porcupines the coarse hairs assume the form of large stiff spines, or quills; in the hogs they are smaller and more flexible, forming bristles. The hairy covering is usually shed once or twice annually, except the manes and tails of such ungulates as the horse, the hairs of which may persist throughout life.

The majority of mammals have a number of large, long hairs, or vibrissæ, arranged in a definite fashion about the mouth, eyes and ears, which serve to a certain degree as tactile organs. In deer and some other ruminants the hairs consist mainly of the cellular pith and hence are easily broken.

The color of mammals is chiefly due to the pigments contained in the hair, which belong to the class known as melanins. Black, white, and brown in various mixtures and shades are the commonest colors. The coloration is chiefly protective, but some such sharp contrasts of black and white as those of the skunks are thought to be warning colors, and the clear white of the under side of the tail of deer, certain hares, etc., to be directive, or distinguishing, marks for the young.

Skeleton.—The skeleton consists of an axial portion, comprising the skull, the backbone or vertebral column, the ribs and the sternum; and an appendicular portion, or the skeleton of the limbs. In the skull the bones are bound firmly together by the overlapping or interdigitation of the edges, except the lower jaw, the ossicles of the internal ear and the hyoid, or tongue, bones. In adults most of the sutures are usually obliterated. The snout or rostrum consists of the intermaxillary, maxillary, palatine and pterygoid bones below and on the sides, and the nasals above, while within are the median vomer and the ethmoid bones. The rostrum abuts against the brain-case or cranium, which is vaulted, and comprises three segments, an anterior one, consisting of the presphenoid, orbito-sphenoids and frontal; a middle segment, consisting of the basisphenoid, alisphenoids, squamosals, and parietals; and a posterior segment, consisting of the basi-occipital, exoccipitals and supraoccipital. The exoccipitals bear the two condyles for articulation with the vertebral column. At the base of the skull, between the occipital and squamosal, are the periotic bones, containing the organ of hearing or internal ear, and the tympanics, which form the bony walls of the orifice of the ear. The tympanics are greatly expanded in whales and some other mammals, forming shell-shaped bullæ.

The vertebral column comprises five sections, the cervical, dorsal (or thoracic), lumbar, sacral and caudal. The cervical vertebræ are seven in number in all mammals, whatever the length of the neck, the only exceptions being the manatees, which have six, and the sloths, which have six, eight or nine. In certain whales, the majority of porpoises and some rodents, the cervicals are more or less united; in the right whales they form a single bony mass. The dorsals vary in number from 9 to 22. Articulated with each is a pair of ribs. The ribs terminate below in cartilages, which sometimes ossify, forming what are called «sternal ribs.» By means of these cartilages the anterior pairs of ribs are connected with the breastbone or sternum, which may consist of a single piece, as in the whalebone whales, or of several segments arranged longitudinally. The posterior pairs of ribs are sometimes called «floating ribs» because their cartilages do not meet the sternum, but are attached to those of the more anterior pairs, or are quite free. The lumbar vertebræ follow the dorsals and are without ribs. In number they vary from 2 to 30 in different forms. The number of dorsal and lumbar vertebræ combined is quite constantly 23 in the odd-toed ungulates (horse, rhinoceros, tapir, etc.), 19 in even-toed ungulates (deer, ox, sheep, etc.), and 20 or 21 in carnivores and most insectivores. Man, the higher apes and many bats have 17. Following the lumbars is the sacrum, consisting usually of three vertebræ joined together and connected with the pelvis. This region is not distinguishable in the whales and sea-cows, which lack hind limbs. The caudals, or tail-vertebræ, complete the column. In man, and in certain apes and bats they are three in number and rudimentary, but as many as 46 are present in the long-tailed pangolins. In the intervals between the anterior caudals below are situated small V-shaped bones, called chevrons, whose chief function is to protect the larger blood-vessels of the tail. They
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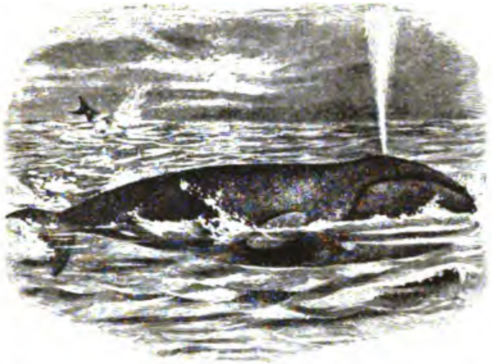
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1. A whale — aquatic type.
2. Antelope — terrestrial type.
3. Bat — aerial type.
4. Ape — arboreal type

tebrates, teeth are not produced indefinitely, but in fixed number. Only two sets are developed. The first, called the milk dentition, appears during infancy, being replaced by the second set, called the permanent dentition, as maturity is reached. The milk teeth are less numerous and usually smaller than those of the permanent set. Teeth occur only in the premaxillary and maxillary bones, and the mandible or lower jaw. The upper teeth are divided into incisors, which are implanted in the premaxillæ; canines, which are almost invariably simple and stand immediately behind the suture between the premaxillæ and maxillæ; and premolars and molars, which occupy the edges of the maxillæ. The premolars have "milk" predecessors, while the molars have not. The nomenclature of the teeth of the lower jaw is the same as for those of the upper jaw, their character being determined by their relation to the latter and by their form and mode of development. While the greatest diversity exists as to the form of the individual teeth, and the development of the dentition as a whole, there are rarely more than 44 in all. The exceptions are among the marsupials, where the number rises to 54 in the marsupial anteater, *Myrmecobius,* and to 64 in a fossil form, *Amphitherium;* also among the cetacea, one species of which has as many as 246 simple teeth. The true anteaters, *Myrmecophagidæ,* and the spiny anteater of Australia, *Echidna,* are without teeth at any time, but many mammals which do not possess them when adult, have rudimentary teeth in the fœtal stages. Such is the case with the whalebone whales, and with the platypus, *Ornithorhynchus.* The rudimentary teeth in these disappear early and are replaced by whalebone in the case of the whales, and by horny plates resembling teeth, in the platypus.

Teeth consist of two portions, the root and the crown. When most complex they contain three structural elements, the enamel, the dentine and the cement. The enamel is hardest and is restricted to the crown, while the dentine makes up the mass of the tooth, and the cement usually surrounds the root, or fills spaces between the enamel-folds of the crown. The enamel develops from the epithelial tissue of the jaws, the dentine from the deeper-lying areolar tissue, and the cement from the walls of the tooth-capsule. Some teeth, such as the incisors of rodents, the tusks of the elephant, etc., grow continuously during life; others complete their growth early. Especially remarkable forms of teeth are the tusks of elephants, which are incisors, and the tusks of the narwhal, the boar and the babirussa, which are canines. When the crowns of the teeth greatly exceed the roots, as in the horse, the teeth are said to be hypsidont or hypselodont; when the reverse is the case, the teeth are called brachydont. Teeth having the crown in the form of tubercles, as in the hog, are called bunodont; those with transverse ridges, as in the ox, many rodents, etc., are called lophodont.

Alimentary Canal.—The mouth, or entrance to the alimentary canal, contains the tongue, which in the majority of mammals is so attached below that it can be protruded but a short distance, but is often sufficiently free to be used in grasping food and turning it about in the mouth during the process of mastication. In those mammals which feed upon ants and termites, such as the anteaters, pangolins, etc., and also in certain fruit-eating bats, the tongue is very long and slender and can be extended far beyond the mouth. On the posterior surface of the tongue are the organs of taste, and the upper surface is often roughened by horny papillæ. A number of large glands, called salivary glands, open into the mouth. Their function is to moisten the food and initiate the process of digestion. The glands most constantly present are the parotid, situated at the base of the ear, and opening inside the cheek, and the submaxillary, situated near the angle of the lower jaw, and opening under the apex of the tongue. At the back of the mouth is the entrance to the œsophagus or gullet, usually a simple tube, leading to the stomach. The stomach is an oblong, curved sac, usually enlarged at the cardiac end where the œsophagus is attached, and smaller at the lower, or pyloric, end, where it joins the intestines. It is usually simple, but in the ruminants and the cetaceans consists of several chambers. The intestines join the stomach at the pyloric end. They are usually of great length, and divided into two distinct sections. The portion nearest the stomach, called the small intestine, is joined below by one of larger diameter called the large intestine. The upper end of the latter is frequently dilated, forming a pouch called the cæcum, which in herbivorous mammals, and notably in rodents and many ungulates, is greatly enlarged or elongated. In man, the higher apes and the marsupial wombat it terminates in a narrow prolongation called the vermiform appendix. Different sections of the small intestine have received the names duodenum, jejunum and ileum; and of the large intestine, colon and rectum. The inferior orifice of the intestines is the anus or vent. Generally speaking, the intestines and cæcum are shortest in carnivorous mammals and longest in such as are vegetable feeders, but the carnivorous whales and seals, which have long intestines, form a conspicuous exception.

Besides the numerous glands situated within the intestine, are two large ones, the liver and the pancreas, whose ducts open into the intestines near the stomach. The liver is a large, flat gland, which may be divided merely into a right and a left lobe as in man, the cetacea and ruminants, or may have these lobes again subdivided into two by a longitudinal fissure. Two smaller lobes, called the Spigelian lobe and the caudate lobe, are commonly added. Attached to the liver is the gall-bladder, which is, however, absent in the cetacea and some other orders.

Kidneys.—The kidneys, whose function is to secrete urine, are situated in the upper part of the abdominal cavity near the vertebral column. They are two in number, oblong and usually simple, but in the cetacea, and also in bears and seals, are divided into separate lobules. A duct or ureter leads from each kidney to the urinary bladder, from which in turn a common duct, called the urethra, leads to the exterior of the body. In the monotremes, however, the ureters do not enter the bladder, but into a common urogenital passage or cloaca.

Lungs.—The lungs are situated in the thorax, which is cut off below from the abdominal cavity by a muscular diaphragm whose action assists in the process of breathing. The lungs consist of two spongy lobes, a right and a left, which are free below, but attached above to the two principal divisions of the windpipe. In the cetacea and sea-cows, the lobes are simple externally, but in other orders are more or less subdivided. A third median lobe, called the azygos lobe, is present in some groups. Air breathed in through the nostrils reaches the lungs through the trachea or windpipe, the upper end of which, the larynx, lies in the throat. Its orifice, the glottis, is protected by a cartilage, called the epiglottis, which prevents particles of food from entering the windpipe. The larynx is made up of cartilages, of which the largest are the thyroid, the cricoid and the arytenoid. Within the larynx are the vocal cords, two parallel elastic, fibrous bands, whose vibrations produce the voice. The lower end of the windpipe divides into two smaller tubes, or bronchii, each of which enters a lobe of the lungs and subdivides into numerous smaller branches. A third bronchius, which enters the right lung, occurs in some cetaceans and ruminants.

Heart.—The heart in mammals is four-chambered, consisting of two thin-walled auricles and two ventricles, both with thick walls, but the right, which supplies only the lungs, thinner than the left. There is no direct communication between the left and right sides of the heart after birth. The valve between the right auricle and the right ventricle is tendinous, except in the monotremes.

The aorta, or principal artery, bends toward the left immediately beyond its connection with the heart and gives off the innominate, left common carotid, and brachial arteries, which, with their branches, supply the head and anterior limbs. Blood is carried from the alimentary canal to the liver by a single vein, except in the monotremes, in which as in lower vertebrates the abdominal vein is present. The kidneys are supplied with blood only by the renal arteries.

Brain.—Except for certain fossil forms, the brain of mammals is characterized by its relatively larger size as compared with that of lower vertebrates, and especially by the magnitude of the cerebral hemispheres and the perfection of the connections between them. In most mammals the surface of the brain is divided by numerous irregular fissures and convolutions. They are absent only in small bats, rodents, and insectivores, and in the *Ornithorhynchus.* The largest forms in each order, generally speaking, exhibit the greatest complexity, and there has been a remarkable development in the class in this direction since Tertiary times. The cetacea have very large and complex brains, though they are small relatively, when compared with the size of the body.

Sense Organs.—The organs of sense, except that of touch, are located in the head. The sense of touch is generally distributed over the skin, but is most acute in the snout, and in the extremities, except when used merely in locomotion. The wings of bats and the prehensile tails of monkeys are also especially sensitive. Some burrowing mammals, such as the mole, have imperfect eyes, the optic nerve being more or less atrophied. The Indian river-dolphin, *Platanista,* is a blind form, having rudimentary eyes, without crystalline lenses. The mammalian ear is characterized, beside the chain of ossicles, already mentioned, by the complex cochlea, which is usually spirally convoluted. The tympanic membrane, or eardrum, seals the auditory chamber from without. In the majority of

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rynchus, Echidna and *Proëchidna*) are limited to Australia, Tasmania and New Guinea. Marsupials occur only in Australia, Tasmania, New Guinea and America. The American marsupials, with the exception of one genus, all belong to the family *Didelphiidæ*, ,or the opossums. Edentates occur only in America, southern Asia and Africa. They have their greatest development in South America. One genus, *Tatu*, extends northward into Texas. Ungulates inhabit all continents except Australia, but only two or three species enter South America. Of the two groups forming the order *Primates*, the lemurs and lemuroids occur only in Madagascar, Africa and southern Asia, while monkeys inhabit only Africa, southern Asia, and South and Central America. One ape, *Macacus inuus*, is found at Gibraltar, but it is only doubtfully indigenous.

Fossil Mammals.—Mammals are believed to have originated as an off-shoot from certain Permian and Triassic reptiles called *Theromorpha* or *Anomodontia*. The earliest recognizable remains of mammals are certain small teeth and jaw-bones found in the Triassic formations. They belonged to forms resembling monotremes and marsupials in some characters, but are usually placed in a separate order, called *Allotheria* or *Multituberculata*. Representatives of the *Allotheria* continued on through the Jurassic and Cretaceous. The existing orders of mammals first appear in the Eocene, the lowest formation of the Tertiary period, being foreshadowed in the lowest beds of that period by certain generalized groups such as the *Creodonta* and *Condylarthra*. The Eocene also contains remains of several groups, or suborders, of ungulate mammals, which have no living representatives. These are the *Ancylopoda, Typotheria* and *Toxodontia*.

The later Tertiary and the Quaternary periods show a greatly increased number and diversity of forms. Many of them represent families which persisted for only a relatively short period and are now extinct; others have continued to the present. Among the oldest of existing genera are *Didelphis* (opossum), *Sciurus* (squirrel), *Myoxus* (dormouse), *Sorex* (shrew), *Vespertilio* and *Vesperugo* (bat), and *Viverra* (civet), which originated in the Eocene; *Tapirus* (tapir), *Rhinoceros, Giraffa* (giraffe), *Elephas* (elephant), *Sus* (pig), *Talpa* (mole), *Erinaceus* (hedgehog), *Mustela* (marten), *Lutra* (otter), *Hyæna, Felis* (cat), and *Phoca* (seal), which originated in the Miocene.

Classification.—The class *Mammalia* was divided by Linnæus into three principal sections, *Unguiculata, Ungulata*, and *Mutica*. The last comprises the cetaceans, the second all the ungulates except the elephant; and the first, the remainder of the class. This classification was replaced by Blainville, who proposed on embryological grounds to divide the class into *Monodelphia*, or mammals with a placenta; *Didelphia*, or mammals without a placenta (the marsupials), and *Ornithodelphia*, or the monotremes. Richard Owen combined the last two subclasses under the name of *Eplacentalia*, and gave the placental mammals the name of *Placentalia*. Speculation as to the origin of the class as a whole led Huxley to propose as the source, a hypothetical group which he named *Hypotheria*, the characters assigned being the absence of milk glands and of a corpus callosum in the brain, and the presence of a quadrate bone for the articulation of the mandible. Existing mammals were divided into *Prototheria*, comprising the monotremes, *Metatheria*, the marsupials, and *Eutheria*, the so-called placental mammals. Cope in 1889, while retaining the subclass *Prototheria* for the monotremes, placed the entire remainder of the class in the subclass *Eutheria*. Flower and Lydekker (1891) adopt Huxley's divisions, while Beddard (1902) makes use of those of Cope. Flower and Lydekker's arrangement of families and higher groups is as follows (fossil groups printed in italics):

Subclass 1. PROTOTHERIA.
Order 1. Monotremata (Monotremes).
Families: Ornithorhynchidæ, Echidnidæ.
(Group, *Multituberculata* or *Allotheria*.
Families: *Plagiaulacidæ, Polymastodontidæ, Tritylodontidæ*.)
Subclass 2. METATHERIA.
Order 2. Marsupialia (Marsupials).
Suborder 1. Polyprotodontia.
Families: *Dromatheriidæ, Amphitheriidæ, Spalacotheriidæ*, Didelphyidæ, Dasyuridæ, Peramelidæ.
Suborder 2. Diprotodontia.
Families: Phascolomyidæ, Phalangeridæ, *Diprotodontidæ, Nototheriidæ*, Macropodidæ.
Subclass 3. EUTHERIA.
Order 3. Edentata (Edentates).
Families: Bradypodidæ, *Megatheriidæ*, Myrmecophagidæ, Dasypodidæ, *Glyptodontidæ*, Manidæ, Orycteropodidæ.
Order 4. Sirenia (Sea-cows).
Families: Manatidæ, *Rhytinidæ*, Halicoridæ, *Halitheriidæ*.
Order 5. Cetacea (Cetaceans).
Suborder 1. Mystacoceti (Whalebone whales).
Family: Balænidæ.
Suborder 2. *Archæoceti*.
Family: *Zeuglodontidæ*.
Suborder 3. Odontoceti (Toothed whales).
Families: Physeteridæ, Platanistidæ, Delphinidæ.
Order 6. Ungulata (Hoofed mammals).
Suborder 1. Artiodactyla (Even-toed ungulates).
Families: Hippopotamidæ, Suidæ, *Chæropotamidæ, Anthracotheriidæ, Merycopotamidæ, Cotylopidæ, Anoplotheriidæ, Dichodontidæ*, Tragulidæ, Camelidæ, *Poebrotheriidæ*, Cervidæ, Giraffidæ, Antilocapridæ, Bovidæ.
Suborder 2. Perissodactyla (Odd-toed ungulates).
Families: Tapiridæ, *Lophiodontidæ, Palæotheriidæ*, Equidæ, Rhinocerotidæ, *Lambdotheriidæ, Chalicotheriidæ, Titanotheriidæ, Macraucheniidæ*.
Suborder 3. *Toxodontia*.
Families: *Toxodontidæ, Typotheriidæ*.
Suborder 4. *Condylarthra*.
Families: *Periptychidæ, Phenacodontidæ, Meniscotheriidæ*.
Suborder 5. Hyracoidea (Conies).
Family: Hyracidæ.
Suborder 6. *Amblypoda*.
Families: *Pantolambdidæ, Coryphodontidæ, Uintatheriidæ*.

- Suborder 7. Proboscidea (Elephants).
  - Families: *Dinotheriidæ,* Elephantidæ.
- (Group *Tillodontia.*)
  - Families: *Anchippodontidæ, Calamodontidæ.*)
- Order 7. Rodentia (Rodents)
  - Suborder 1. Simplicidentata.
    - Families: Anomaluridæ, Sciuridæ, Haplodontidæ, *Ischyromyidæ,* Castoridæ, Myoxidæ, Lophiomyidæ, Muridæ, Spalacidæ, Geomyidæ, Dipodidæ, *Theridomyidæ,* Octodontidæ, *Castoroididæ,* Hystricidæ, Chinchillidæ, Dinomyidæ, Caviidæ, Dasyproctidæ.
  - Suborder 2. Duplicidentata.
    - Families: Lagomyidæ, Leporidæ.
- Order 8. Carnivora (Carnivores).
  - Suborder 1. Carnivora vera (Fissipeds).
    - Families: Felidæ, Hyænidæ, Protelidæ, Viverridæ, Canidæ, Ursidæ, Mustelidæ, Procyonidæ.
  - Suborder 2. Pinnipedia (Pinnipeds).
    - Families: Otariidæ, Trichechidæ, Phocidæ.
  - Suborder 3. *Creodontia.*
    - Families: *Hyænodontidæ, Proviverridæ, Arctocyonidæ, Mesonychidæ.*
- Order 9. Insectivora (Insectivores).
  - Suborder 1. Insectivora vera.
    - Families: Tupaiidæ, Macroscelididæ, Erinaceidæ, Soricidæ, Talpidæ, Potamogalidæ, Solenodontidæ, Centetidæ, Chrysochloridæ.
  - Suborder 2. Dermoptera.
    - Family: Galeopithecidæ.
- Order 10. Chiroptera (Bats).
  - Suborder 1. Megachiroptera.
    - Family: Pteropidæ.
  - Suborder 2. Microchiroptera.
    - Families: Vespertilionidæ, Nycteridæ, Rhinolophidæ, Emballonuridæ, Phyllostomatidæ.
- Order 11. Primates.
  - Suborder 1. Lemuroidea (Lemurs and Lemuroids).
    - Families: *Hyopsodontidæ,* Chiromyidæ, Tarsiidæ, Lemuridæ.
  - Suborder 2. Anthropoidea (Monkeys and Man).
    - Families: Hapalidæ, Cebidæ, Cercopithecidæ, Simiidæ, Hominidæ.

The groups of existing mammals whose structural peculiarities are such as to entitle them to rank as separate families vary greatly as regards the number of genera and species they comprise, some being represented by a multitude of different forms, while others consist only of a single species, or a single genus with but a few species. Families consisting of only a single genus and species are as follows: the *Chiromyidæ,* established for the reception of the Aye-Aye, a singularly modified lemuroid mammal, confined to Madagascar; the *Dinomyidæ,* comprising only a large Peruvian rodent, somewhat like a paca, of which a single specimen is known; the *Antilocapridæ,* represented only by the Prong-horn of the western plains of North America; the *Notoryctidæ,* comprising only a small mole-like marsupial recently discovered in South Australia; the *Ornithorhynchidæ,* comprising only the Platypus, or Duckbill, of Australia. These and other restricted families are to be looked upon as fragments of groups of genera and species, of which the greater number are extinct,
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Matt. vi. 24 and Luke xvi. 9. Milton makes Mammon a fallen angel of sordid character.

Mammoth, an elephant (*Elephas primigenius*) which inhabited the temperate parts of the northern world during the Glacial period, and at its close spread northward with the retreat of the ice, and survived until the Neolithic period of human history. Some account of the origin and probable wanderings of the species is given in the paragraph relating to fossil elephants under ELEPHANT. Mammoth remains have been found in intimate association with the handiwork of savage man; and upon a piece of bone a portrait of this animal was found scratched, the accuracy of which shows a close acquaintance by the Cave-dwellers of France with the animal in life, and much artistic skill. This elephant, although the word «mammoth» has become an expression for hugeness, was little if any larger, on the average, than the modern Asiatic elephant, to which it was nearly related. Its remains are abundant and enable us to reconstruct its form and features completely, especially since the remarkable discovery, first in 1799, of carcasses frozen into the icy cliffs along the Arctic coast of Siberia. The latest and most important discovery of this kind occurred in 1901. Since the earliest known times ivory from buried tusks of these animals has been obtained from northern Siberia and Alaska, and many curious stories were invented to account for its origin, especially among the Chinese, who had never seen an elephant; but the specimens above mentioned contained not only the tusks still in their sockets, and every bone in its place throughout the skeleton, but a great part of the flesh was in a condition fit for sledge-dogs to eat and enjoy, and was covered with thick skin still clothed with long dark hair, beneath which was a dense woolly fur, well fitted to protect the animal against arctic cold. The ears were much smaller than those of modern elephants. This specimen of 1901, which is preserved in the Royal Museum at St. Petersburg in the attitude in which it was found buried, measured 16 feet 4 inches from the forehead to the extremity of the tail; its height was 9 feet 4 inches; and the tusks, along the outer or greater curve, measured 9 feet 6 inches. Of other well-known specimens, that skeleton mounted in Chicago is one of the largest known, and its tusks measure 9 feet 8 inches. The largest tusks on record are a pair found in Alaska, which measure 12¾ feet in length. All mammoth tusks show an outward and upward sweep very distinct from the growth of elephant tusks. The mammoth seems to have been extremely numerous all over northern Europe, Asia and North America, especially during post-glacial times, when northern Asia was covered with pine forests to the borders of the Arctic Sea, affording plentiful food in their leaves and twigs upon which these animals browsed. The disappearance of these forests, due to slow climatic changes, is supposed to be the principal influence which led to the extermination of the species, a fact otherwise not easily to be explained. It is probable that human hunting had much to do with the mammoth's final disappearance. Consult: Beddard, 'Mammalia' (1902); Lucas, 'Animals of the Past' (1901). Compare MASTODON.

Mammoth Cave, Ky., a remarkable American cavern, in Edmondson County, 85 miles southwest of Louisville, reached by a small branch line connecting at Glasgow Junction with the Louisville & Nashville railroad. Its areal diameter is about 10 miles, and about 100 miles of passage-way have been explored, including avenues, chambers, pits, domes and rivers. What is termed the Main Cave is three miles long, varying in width from 40 to 175 feet, and in height from 40 to 125 feet. Its greatest enlargement is known as the Chief City (or Temple), an oval room 541 feet long, 287 feet wide, and 125 feet high; anciently a rendezvous of the Indians, whose torches and other relics have been found in abundance. The Star Chamber mimics the starry heavens by reason of its lofty ceiling of black oxide of manganese flecked by snowy crystals of gypsum. The cavern exists in five successive tiers, through which, at various points, shafts have been cut, which are styled pits or domes, according to the point of view. The largest are the Bottomless Pit, Gorin's Dome, the Mammoth Dome, and the Maelstrom, and their average depth is about 100 feet. Oval depressions, locally known as «sink-holes,» drain through the pits and chasms, and form subterranean lakes and rivers; which finally find an outlet to the neighboring Green River. The largest, the Echo River, gets its name from the wonderful reverberations of sound along its course. Boats are provided for short voyages. Eyeless fish abound, of which there are three or four species; besides, blind crawfish, blind crickets, flies, beetles and spiders, and other abnormal fauna, are found on the walls and under the rocks. The structure and habits of these animals have been studied with great care.

Beyond River Hall long avenues extend, many adorned by marvellous gypsum rosettes and brilliant arches of crystal efflorescence in the most fantastic diversity. Cleveland's Cabinet is frequently mentioned as a treasure-house of cave flowers; but some of the smaller rooms, for instance, Charlotte's Grotto, can boast of finer displays. The great cavern is said to end at Croghan's Hall, where is the Maelstrom already mentioned, but the few who have dared go to the bottom of this profound abyss report wide and long avenues beyond, which are yet to be explored. Everywhere, even in the deepest pits, the atmosphere is both chemically and optically pure; the temperature is uniformly about 54° F., all the year around, as has been determined by a long series of exact scientific observations, in order to discover the temperature of the crust of the earth.

The discovery of the Mammoth Cave is usually credited to a hunter named Hutchins, in 1809; but the present manager of the estate finds that the county records, in 1797, fix the entrance to this cavern as a landmark for a piece of real estate. The locality first gained notoriety by reason of its immense deposits of saltpeter, which were used in the manufacture of gunpowder, during the War of 1812. After passing through the hands of several owners, the cave was bought by Dr. John Croghan, who willed it to his nephews and nieces, with instructions that at their death it should be sold at auction. An earnest wish has been expressed by many that the famous cavern should eventually become a State or National park. See also Caves; Cave Animals. H. C. Hovey,

Author of ‹Celebrated American Caverns.›

Mammoth Hot Springs. See Yellowstone Park.

Ma'mo, a bird (*Drepanis pacifica*) of the Hawaiian Islands, related to the creepers, and now nearly extinct because of the great demand in past years for their yellow feathers for making the feather-cloaks formerly worn as insignia of royalty by the chiefs. Other birds supplied certain other required feathers. Very few of these cloaks remain in museums.

Mamoré, mä-mō-rā', a river of Bolivia which has its rise in the Cordillera Real, near Sucre, and flows first east by south, then forms almost a semicircle toward the north to Trinidad, from where its course is nearly north to where it unites with the Beni and forms the Madeira River. In the first part of its course it is called Rio Grande. The Mamoré is about 1,300 miles long and navigable for about 1,000 miles, with some obstructions. About 40 miles above its junction with the Beni are the Guajara Falls, above which navigation is free for about 400 miles to places where fallen logs have filled in between the banks and formed dams.

Mam'palon, an aquatic animal (*Cynogale bennetti*) of Borneo, of the civet family. It is otter-like in form, is about 18 inches long, has stout webbed plantigrade feet, and is thoroughly adapted to an aquatic life while retaining purely viverrine characteristics of structure.

Man (*Homo sapiens*), the most highly developed of the animals of the earth, differing from the other creatures in intellectual and spiritual nature, but so closely resembling them in physical organism that it is perfectly clear from the point of view of the comparative anatomist that he is not to be separated from the animal kingdom. Physiologically the distinction between man and the anthropoid ape is slight. As to the place of man in the animal kingdom there is some doubt, largely a matter of technical nomenclature. The point at issue is whether man is to be put in a separate order, and, if not, just what higher animals are to be included in the same order with him. The view that man is to be grouped with the anthropoid apes is taken by Huxley, Darwin, and Haeckel, all following Linnæus; it is the predominant view, and classes man with the apes in the order *Primates.* Sir Richard Owen, who followed Cuvier, was the foremost scientist of the 19th century to classify man as a separate order of the mammals, the *Bimana* in opposition to the *Quadrumana.* The order of *Primates,* to take the more authoritative classification, is divided into: the *Lemuridæ,* of which the lemurs (q.v.) are typical; the *Simiadæ,* including the «higher» apes; and the *Anthropoidæ,* Man. The question as to the demarkation and the interrelation between the last two classes then arises. Comparative embryology may furnish some clue to this in the future; at the present the development of the embryo of the simians is almost entirely unknown. Geology and palæontology on the other hand not only have furnished no great assistance to this problem, but in the nature of the case are not likely to do more in the future. Haeckel's *Pithecanthropus* is little more than nomenclature; and it is only in minor degrees

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mosses from other worlds, in brief, that animal life is a continuation or evolution of vegetable life — a conclusion to which the very difficulty of drawing a hard and fast line between the two naturally leads. The attempt to carry back man's ultimate ancestry still further is to be found in the theory of abiogenesis (a term introduced by Huxley in place of the less exact «spontaneous generation»). This theory is urged both by Huxley and by Haeckel, notably in his 'Riddle of the Universe' (1900); and to the same end tend the apparently successful experiments in America of Loeb and others, who would show a close connection between electro-chemic phenomena and nervous force or life itself.

The life habits of prehistoric man, as well as his antiquity on the earth, are known almost entirely from fossil remains of various sorts. The data, however, are perplexingly scanty and insufficient for strictly logical deduction. Thus, although the general character of the Neanderthal skull, as Taylor says, «is less human and more simian than any other known skull . . . its precise age is doubtful, and it would be unsafe to regard it as the type of a special race since its characteristics . . . have been occasionally reproduced in modern times.» In brief, any single anatomical specimen, simply because it is isolated, may not be considered typical of the *Urmensch*, nor as evidence of his antiquity, nor as belonging to *Pithecanthropus erectus*, inasmuch as the isolated specimen may be abnormal and freakish. Actually misleading are such «fossil» finds as the various anthropolites or petrified men, for the anthropolite is not a true fossil but merely a quasi-petrifaction due to the action of calcareous waters, in short, is due to chemical and not to geological action. Had such remains been real fossils they would have put the appearance of man upon the earth much farther back than it can be put. The information to be gathered from utensils found together with human remains and from adjacent remains of wild beasts is valuable. Tools and hunting weapons, bones of tropical fauna and remains of man are found in the gravel beds of western Europe; it apparently follows that man antedates the Glacial period, inasmuch as this tropical fauna there was previous to the Ice Age, and since remains of Glacial fauna together with human remains occur in later (and superior) geological deposits. Thus the question of the antiquity of man becomes the simpler question of the date of the Ice Age. The answer is, 60,000 years ago at least. It is largely on the discovery of flint implements styled «chelléans» at Chelles in France that man is thus dated back to the semitropical epoch of the Pleistocene period.

The implements of prehistoric man, as ordinarily classified by material, form the basis of a division of early industrial development into the Stone Age, the Bronze Age, and the Iron Age. The use of animal sinews, bones, etc., apparently antedates the period of stone implements; hence the more elaborate classification into Zoomimic, Protolithic, Technolithic, and Metallurgic, for which see ANTHROPOLOGY, AMERICAN.

As industrial arts began in imitation of the animals, so it is possible that the worship of man began with his wonder at the beasts, and with his personifying them, and secondly all natural forces. Animism or spirit worship was probably a second stage, although Herbert Spencer makes its sub-species ancestor-worship, which is still a live force in China, the source of all religious cults, tracing back to it totemism, as a sort of ghost-worship, and naturism, hinting that the spirits of the departed were supposed to take up their dwelling in trees and rocks. Magic is closely related in primitive cultus both with naturism and animism. (See RELIGION.) (See also ANTHROPOLOGY, AMERICAN; ANTHROPOLOGY; ETHNOLOGY; ANTHROPOMERY.) Consult: Keane, 'Man, Past and Present' (1899); Girard, 'Aide-mémoire d'Anthropologie et d'Ethnographie'; 'The American Anthropologist'; Mivart, 'Man and Apes' (1873); Quetelet, 'Physique Sociale' (1869).

Man and Nature, a work of great research written in 1864 by George Perkins Marsh (q.v.). Its full title was 'Man and Nature, or Physical Geography as Modified by Human Action.' The work became at once a standard with international recognition; a considerably enlarged Italian edition was issued at Florence in 1870; and a second American edition, with further changes, appeared in 1874.

Man-eater, a term applied to any fierce animal which has acquired, or is believed to have acquired, a habit of killing human beings as food. Lions, tigers, leopards and other great cats are accused of it, and undoubtedly many of these beasts, finding how easily a man or woman among East Indian or African villagers may be struck down or seized when sleeping in a flimsy hut, make their lairs near settlements and for a time regularly subsist upon human victims. Such are sometimes, but not always, old cattle-thieves, whose teeth are worn, and which feel unable or unwilling to undertake the exertion of tracking and pulling down wild animals; but this is not always the case. When such a beast has taken his residence in a district no pains must be spared to kill him, for he will not cease his depredations. Horses, elephants, camels, etc., sometimes become man-eaters in effect, understanding and exercising their power over him for harm.

A man-eater shark is the great white or blue shark (*Carcharodon carcharias*), which is one of the largest and most formidable of fishes. See SHARK.

Man-of-the-Earth, a local name in the Southern States for the wild potato-vine (*Ipomœa pandurata*), which «over the dry soil of fields . . . spreads in summer many of its great, white, waxy flowers, effectively spotted at their bases with purple.» See IPOMÆA; MORNING-GLORY.

Man in the Iron Mask, The. See IRON MASK, THE MAN IN.

Man, Isle of. See ISLE OF MAN.

Man-of-war, an armed naval vessel regularly employed in the service of a government for war purposes. See NAVY OF THE UNITED STATES.

Man-of-war Hawk, or **Frigate-bird,** a tropical web-footed bird (*Fregata aquila*), of the family *Pelecanidæ*. The color of the adult bird is shining black, glossed with green, the female being duller in hue. Including the long tail the male bird reaches 3 feet in length, but the body is extremely small. The bill is longer than the head, strong, hooked at the point, and sharp. In proportion to their size their wings are longer than in any other bird, and have an extent of 7 feet or more. Their flight is so powerful that they are seen more than a thousand miles from shore. They move with great difficulty on land, and rarely alight on the water. Possessing great strength and superior power of wing, the frigate-bird pursues terns or gulls which have secured a fish, and by beating them with wings and beak forces them to drop or disgorge it; then seizes the prey before it reaches the water. It also catches flying-fish for itself. Its usual locality for breeding is the summit of some rocky cliff, but breeds among trees where there are no rocky shores, making a rough platform of sticks. There is only one chalky white egg. This species is found throughout the tropics, and a second species (*F. minor*) ranges about the Indian and South Pacific Oceans.

Man-yoshu, măn-yō-shoo', or **Manyōshiu** (Japanese, COLLECTION OF ONE THOUSAND LEAVES), Japanese anthology, the most ancient in the language. It is believed to have been completed early in the 9th century; it comprises about 4,000 poems which form a valuable index to the history, customs, and literary attainments of the time. Among its hundreds of authors the most able are Hitomaro and Akahito. The poems form a record of about 130 years, covering the latter part of the 7th and the early part of the 8th centuries.

Man'acle Rocks, England, a dangerous reef on the south coast of Cornwall, not far from Lizard Head and near the town of Falmouth. They are barely visible, except at low water, and there is no warning of their presence to the mariner except a bell buoy. Many wrecks have occurred here.

Managua, mă-nä'gwä, Nicaragua, (1) the capital of the state, near the southwest shore of Lake Managua, 32 miles south-southwest of Leon, consists of long rows of huts, and a large square lined with houses of two stories. The centre of the square is occupied by a large church, and there is another large church with a conspicuous white arched portal. The inhabitants, chiefly Indians, are industrious. A railway connects Managua with Corinto on the Pacific. Pop. about 30,000; (2) the lake, about 38 miles long, discharges itself into that of Nicaraugua, above which it has an elevation of 16 feet, while its elevation above the Pacific is 156 feet. It has attracted a good deal of attention in connection with a proposed navigable communication between the Atlantic and Pacific.

Man'akins, a rather undefined group of South American tropical birds, mostly of the family *Pipradæ*, related to the North American tyrant-flycatchers. They are small, brightly colored (but the females are usually much plainer than the males), and the wings often bear curiously modified and often highly ornamental feathers. They are of terrestrial habits, staying upon or near the ground in wooded places, clinging to herbs and twigs of bushes like chickadees, and subsisting upon insects largely caught on the wing. Some of the species, called «dansadors» in Brazil, gather in little parties in the breeding season, and go through queer active motions, called dancing. Consult: Evans, 'Birds' (1900).

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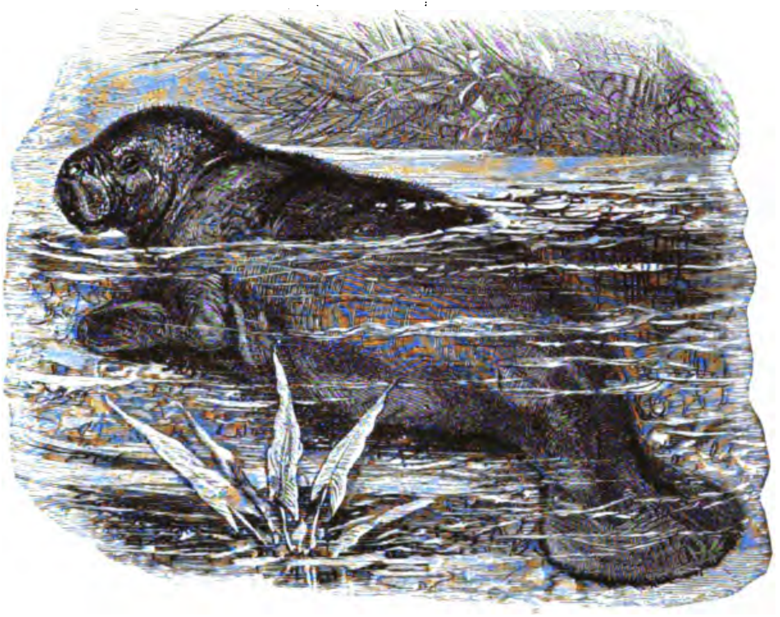

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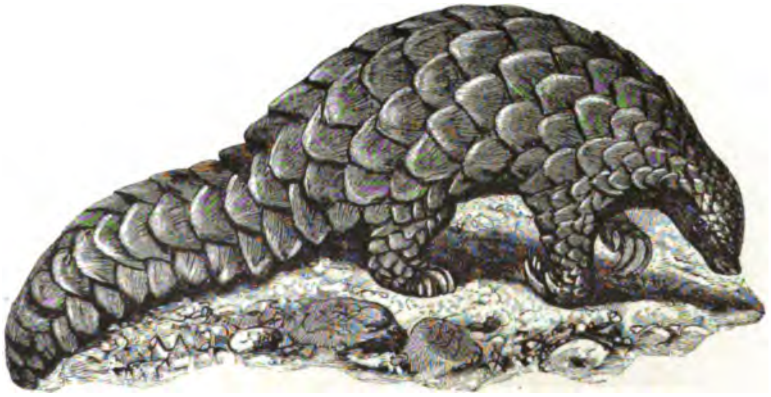

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1. West Indian Manatee. 2. Short-tailed Indian Manis.

in rear, and sent 250 sharpshooters to take position on its left. These dispositions were completed about 2 P.M. Meanwhile Birney's division had advanced, steadily driving in the Confederate outposts and from Wapping Heights beyond which was Wright's line. About 4 P.M. Spinola's Excelsior brigade and two regiments of Ward's went forward at a charge and, sweeping past Wapping Heights, engaged Wright's men in a close and severe fight, driving them back upon Rodes, who stood firm, the artillery checking the Union advance about dark, Rodes' line not being engaged, and losing but 15 killed and wounded. Wright's loss was 19 killed, 83 wounded, and 66 missing. French's loss was 21 killed and 84 wounded. Ewell fell back to Front Royal during the night. Next morning the Union advance marched to Front Royal, but all of Lee's army had passed and, marching swiftly through Chester and Thornston's gaps, it took position on the south side of the Rappahannock. Consult: 'Official Records,' Vol. XXVII.; Humphreys, 'From Gettysburg to the Rapidan.'

E. A. CARMAN.

Manasseh, the name of several scriptural personages: (1) eldest son of Joseph: b. Egypt. When brought with Ephraim to receive the blessing of his grandfather Jacob, the old man placed his right hand upon the head of the younger, and his left upon that of Manasseh, thus depriving the latter of the precedence due to his priority of birth. The descendants of Manasseh formed a tribe, which, in Canaan, was settled half beyond the Jordan, and half on the west side. (2) A king of Judah, who was made tributary to Esarhaddon, carried captive to Babylon, but restored upon his repentance. (3) A priest who in the time of the prophet Malachi built a rival temple on Mount Gerizim.

Manatee', an aquatic mammal or «sea-cow» of the order *Sirenia* (q.v., for general structure), several species of which inhabit the fresh waters along the eastern coasts of tropical America, and of western Africa. The body is somewhat seal-like in shape, reaches a length of eight or ten feet, has a large round head with bristly, tumid lips, no apparent neck, no external ears, the forelimbs converted into paddles, no hind limbs, and the tail spade-shaped, like that of a beaver. The thick wrinkled skin is blackish, and almost hairless, but a coat of short, seal-like fur clothes the fœtus, indicating descent from furry ancestors. Structurally the manatee differs from other sirenians in having only six cervical vertebræ, and in the large number of molar teeth, which apparently go on increasing indefinitely during the animal's life, — the suggestion being, as Bedard points out, that they are worn away by the attrition resulting from so much sand being mixed with the daily food. The cleft lip to be mentioned hereafter, is also a generic peculiarity. The manatees are stupid, gentle, defenseless and harmless creatures, showing great affection for their young, one or two in number, which are nursed at pectoral udders, often while the mother stands erect upon her tail enfolding the «calves» with her broad arms. They never come ashore, but secrete themselves amid aquatic vegetation, where the only enemies they need fear are the larger alligators, and the jaguar. Their food consists of fresh-water weeds and their roots, and these are procured by means of the curious form of the upper lip: «this is split in two, and the two halves, which are furnished with strong bristles, can play upon each other like the points of a pair of forceps.» This cleft-lip is only suggested in the case of the dugong, but the fœtus of that animal shows the structure plainly, indicating that the manatee is the more primitive form of the two. The flesh is excellent for food. The American manatees have been nearly exterminated. They formerly abounded in the Indian River and other marshy waters about southern Florida, but by the end of the 19th century had been reduced to a small carefully protected band near Biscayne Bay. They still survive in small numbers along the coast of the Carribean Sea and about the mouths of the Orinoco. The Florida manatee is called by American zoologists *M. latirostris,* and is regarded as different from those of Central and South America, long known as *M. americanus.* The African species is *M. senegalensis.*

Consult: Beddard, 'Mammals' (1901); Alston, 'Biologia Centrali-Americana' (1875); 'Standard Natural History,' Vol. V. (1885).

Manatt, James Irving, American educator: b. Millersburg, Ohio, 17 Feb. 1845. He was graduated from Iowa College in 1869, having previously served for a time in the Federal army. He engaged in journalism, but soon abandoned it to continue his studies and in 1877–84 was professor of Greek at Marietta College; in 1884–9 he was chancellor of the University of Nebraska and since 1893 has occupied the chair of Greek literature and history at Brown University. With Tsountas he has published 'The Mycenæan Age' (1895).

Manayunk, măn-ạ-yŭnk'. See PHILADELPHIA.

Man'by, George William, English inventor: b. Hilgay, Norfolk, 28 Nov. 1765; d. Southtown, Great Yarmouth, 18 Nov. 1854. He was educated at the military college of Woolwich, and became in 1803 barrack master at Great Yarmouth. His attention having been drawn to calamities resulting in cases of shipwreck, from the difficulty of establishing communication with the shore, he attempted casting a rope from the shore to the wreck by the agency of gunpowder. Chains were unable to stand the shock of the discharge, but stout strips of rawhide closely platted together were found to answer; and on 12 Feb. 1808, the entire crew of the brig Elizabeth, wrecked within 150 yards of the beach, were rescued by the simple contrivance of Capt. Manby. In 1810 his invention was brought before a committee of the House of Commons, and having been favorably reported on, he received a grant of money, and all the dangerous stations on the British coasts were supplied with his apparatus. He also contrived shells filled with luminous matter, to enable the crew to perceive the approach of the rope, in the manufacture of which he suggested several improvements. He published the 'History and Antiquities of the Parish of St. David, South Wales' (1801); 'The Preservation of Shipwrecked Persons' (1812); 'Journal of a Voyage to Greenland in 1821' (1822); and a number of writings relative to shipwrecks and to his various inventions.

Mance, Jeanne, zhän mäṅs, French philanthropist: b. Nogent-le-Roi, France, 1606; d. Canada 1673. She was a religious enthusiast and was one of the party conducted by Maisonneuve (q.v.) to Canada in 1641, and was an able assistant to him in the religious enterprises established in Canada. She was an indefatigable worker, had charge of the hospital at Montreal and exercised much influence in the government of the colony. She made several visits to France to obtain the funds necessary in the work and died head of the Sisters of Saint Joseph.

Mancha, män'chä, **La,** Spain, an ancient province of New Castile, now forming the chief part of the province of Ciudad Real. It is almost encircled by mountains and is an immense elevated plain intersected by ridges of low hills and rocks, watered by the head-streams of the Guadiana, almost treeless with the exception of a few dwarfish oaks and olive trees, but carefully cultivated and rich in grain, grape vines, and esparto grass. The region is one of the most agreeable in Spain, and is celebrated by Cervantes in Don Quixote de la Mancha. The inhabitants are affable and great lovers of music and dancing. Chief towns, Ciudad Real and Ocana.

Man'chester, Conn., town, in Hartford County; on the Hockanum River, and on the New York, N. H. & H. railroad (formerly New England railroad); about eight miles east of Hartford. Until 1823, when it was incorporated as Manchester, it formed a part of East Hartford; it includes the villages of Highland Park, Buckland, Manchester, Manchester Green, and South Manchester. The town has extensive manufacturing plants, the most important being the Cheney Silk Mills. It has also cotton and woolen mills, paper mills, needle works, and electrical supply works. A large amount of tinware is made in Manchester. There are two public libraries, one in the village of Manchester, and one in South Manchester. Pop. (1900) 10,601.

Manchester, England, a city, inland port, and municipal county of Lancashire, 31 miles east of Liverpool, on the Irwell, an affluent of the Mersey, since 1894 connected with the sea at Eastham on the Mersey estuary, by the Manchester ship-canal, 35½ miles long. It is one of the principal manufacturing cities in the world and the cotton trade centre of Great Britain. It stands on a large hill-encircled plain, and with Salford, a suburban municipality on the west bank of the Irwell, covers over 13,000 acres, while railways, steam and electric street railroads communicate with the surrounding towns and villages of one of the most populous industrial regions of England. Four main lines of railway connect with all parts of the kingdom. The principal among its many fine public buildings are, the Exchange, built in the Doric style; the Town Hall, an elegant building of Ionic architecture, formed on the model of the Temple of Erectheus at Athens, and the Corn Exchange. Of over 300 places of worship the chief are St. John's Roman Catholic Cathedral in Salford, which has a splendid interior and a spire 240 feet high, and the «Old Church» or Anglican cathedral, a fine Gothic building dating from 1422, and recently restored. It has numerous educational institutions, one of which, the college founded by Humphrey Chatham in 1665, contains a large library, while Owens College,

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Manchester was known at an early period, the Romans having a station here. In 620 it was taken from the Britons by Edwin, king of Northumbria, and was shortly after occupied by a colony of Angles. The conversion of the inhabitants to Christianity was effected about 627 by the preaching of Paulinus, and a church dedicated to St. Michael was erected. Manchester next passed to the Danes, who were expelled about 920 by Edward, king of Mercia. Manchester and Salford both had charters in their early days from their feudal lords. In 1422 the church (now the cathedral) was built and collegiated. During the civil war possession of Manchester was keenly disputed, and the town suffered much at the hands of both parties. It has played an important part in the political history of the country, especially in connection with the agitation for parliamentary reform and the establishment of free-trade. An important episode in its modern history was the cotton famine and distress caused by the Civil War in America. Manchester became the seat of a bishopric in 1847. The title of lord mayor was conferred on the chief magistrate in 1893. The population in 1773 amounted to 26,426; in 1801 it was 106,798; in 1891 the municipal borough had a population of 505,368. The population of Salford in 1891 was 198,139. In 1901 the population of Manchester was 543,872; of Salford, 220,747.

Manchester, Iowa, city, county-seat of Delaware County; on the Maquoketa River, and on the Illinois Central railroad; about 130 miles northeast of Des Moines and 45 miles west of Dubuque. It is situated in an agricultural region, and its excellent water-power is utilized in manufacturing industries. The chief manufactures are woolen goods, tiles, brick, fencing, flour, wagons, carriages, and dairy products. Manchester is the trade centre of a large part of Delaware, and the adjoining counties, and ships farm produces, dairy products, and live-stock. A United States fish hatchery is in the vicinity. Pop. (1900) 2,887.

Manchester, Mass., town, in Essex County, on Massachusetts Bay; and on the Boston & Maine railroad; about five miles southwest of Gloucester. The first settlement was made in 1630, and until 1645 the place was called «Jefrey's Creek,» when the name was changed to Manchester and the town was incorporated. Since 1845 Manchester has been a favorite summer resort, one of the attractions being a Singing Beach. In addition to good public schools the town has a free public library in the Coolidge Memorial Library Building. Consult: Lamson, ‹History of the Town of Manchester.›

Manchester, N. H., city, one of the county-seats of Hillsboro County; on the Merrimac River at the mouth of the Piscataquog, and on branches of the Boston & Maine railroad; about 17 miles south of Concord, the capital of the State, and 56 miles north of Boston. The first settlement was made in 1722, and for a number of years it was called Amoskeag and Harrytown. In 1751 it was incorporated as «Derryfield,» and in 1810 the name was changed to Manchester. It was chartered as a city in 1846. The Amoskeag Falls (54 feet) in the Merrimac, above the city provides extensive water-power which by means of canals is made available for manufacturing. The city's prosperity is largely dependent upon this water-power, which for years has been controlled by the Amoskeag Manufacturing Company. The city has over 400 manufactories, representing about 60 different industries. The capital invested is about $25,000,000, and the number of employees about 16,000. The chief industrial establishments are the cotton mills, the Amoskeag, Amory, Manchester, and Stark mills alone have a capital invested of about $14,018,000, and their annual output is estimated at $11,000,000. Other manufactures are foundry and machine-shop products, (especially locomotives and fire-engines), hosiery, paper, boots and shoes, wooden-ware, needles, woolen goods, knit goods, leather, lumber, wagons, carriages, and furniture. The system of waterworks, owned by the city, has a reservoir of 16,000,000 gallons capacity which is fed from Lake Massabesic, a body of pure water about four miles from the city. The works were completed in 1874 at a cost of $600,000. Some of the principal public buildings are the Government building, the Roman Catholic Cathedral, the county court-house, Sacred Heart Hospital, Hospital of Our Lady of Lourdes, and a public library, which contains about 46,000 volumes. The several public parks are well kept and add much to the attractive features of the city. The city has the State Industrial School, Saint Joseph's and Saint Patrick's orphanages, and Saint Patrick's and Saint Vincent's Homes for the Aged. The educational institutions are a public high school, three parish high schools, a number of grammar and elementary public and parish schools, a training-school for teachers, Saint Augustine's and Saint Mary's academies, and Saint Anselm's College. There are five national banks with a combined capital of $750,000, and six savings banks, with a surplus of $855,500. Pop. (1890) 44,126; (1900) 56,987.

Manchester, Vt., village, one of the county-seats of Bennington County; on the Battenkill River, and on the Bennington & Rutland railroad; about 32 miles south by west from Rutland. Manchester was one of the disputed places in the early days, when what is now Vermont was nearly all owned by New Hampshire, but a part by New York. In 1761 Manchester was incorporated as a town and as a village in 1900. It is situated in a beautiful locality near Mount Equinox, which is 3,816 feet above the sea. The village is in a fertile farming section, where dairy products are a chief source of income. An excellent quality of marble is found in the vicinity, and the forests furnish a considerable amount of timber for the lumber mills. The water from mineral springs nearby is shipped to many parts of the country. Fishing rods and ginger champagne are manufactured extensively. It is the seat of the Burr and Burton Seminary, and has the Skinner Memorial Library, which contains about 17,000 volumes. A large part of the sidewalk of the village is made of marble. Manchester is a favorite summer resort. Pop. (1900) 1,955.

Manchester, Va., city, in Chesterfield County; on the James River and on the Atlantic C. L., the Seaboard A. L., and the Southern R.R.'s. It is opposite Richmond, with which it is connected by several bridges. It is situated in an agricultural and coal region; and its industries are connected largely with the products of the farms and mines. At Manchester there is a fall in the James River of 100 feet in about six miles. The extensive water-power is used for manufacturing in both Richmond and Manchester. Its chief manufacturing establishments are foundries, cotton mills, flour mills, woodenware factories, brick yards, paper mills, tanneries, and the repair shops of the Southern railway. The city owns and operates the waterworks. Pop. (1900) 9,715.

Manchester Canal, England, a great ship-canal, by which Manchester (q.v.), an inland town, was virtually converted into a seaport. The canal works were begun 11 Nov. 1887 and triffic was fully started in the beginning of 1894, the canal having been opened over a part of its length in 1891. The canal is 35½ miles long, the seaward end being at Eastham on the south side of the Mersey estuary, where three large locks have been constructed. There are locks on other portions of the canal, Manchester being situated 60 feet above sea-level. The minimum width of the canal at bottom is 120 feet, the maximum 170 feet; the minimum width at water-level is 172 feet, the maximum 230 feet; the minimum depth is 26 feet, on the lock sills it is 28 feet. From Manchester to Warrington the canal follows generally the course of the Irwell and the combined Irwell and Mersey, the river being deepened, widened, and straightened, where this was deemed advisable. In the lower part of its course the canal becomes semi-tidal, and from Runcorn onward it runs along the southern bank of the Mersey estuary, parallel with and near the river. At one point the Bridgewater Canal crosses the Manchester Canal, by a swinging caisson capable of being revolved while full of water to let a vessel through that has masts too high to pass under. The contract for constructing the canal was let at $26,750,000, but the company had to raise a sum of over $75,000,000 as capital. Of this sum Manchester contributed $25,000,000, stipulating for unconditional control by a majority of the directorate.

Manchuria, măn-choo'rĭ-ạ, **China,** comprises the northeasternmost portion of the empire, called by the Chinese TUNG SAN SHÊNG, 'Three Eastern Provinces,' from its administrative divisions, Hilung Kiang, the northern province; Kirin, the central province, and Sheng-King, the southern province. It lies mainly between lat. 40° and 53° N. and lon. 118° and 135° E., and is separated from Asiatic Russia on the north and northeast by the Amur, on the east by the Usuri, and on the northwest by the Argun. On the west it is bounded by Mongolia and China proper, part of the boundary being the Palisade Barrier, separating it from the province of Pe-chi-li; on the south the boundaries are the Liao-tung Gulf, the Strait of Pe-chi-li, Korea Bay, the Yalu River, and Korea. The estimated area is 363,610 square miles. Vast chains of mountains ramify all over the country, one of them forming the south limits of the valley of the Amur. The principal rivers are the Amur; the Argun; the Sungari, the vast basin of which occupies a great part of the territory; the Usuri, like the Sungari, a tributary of the Amur; and the Liao-ho, flowing south into the Gulf of Liao-tung. The Nonni is an important southward-flowing tributary of the Sungari, and the Hurka or Khurkha joins the

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an unparalleled scale. The route of the Siberian railroad was originally surveyed with Vladivostok on the Pacific coast of Russian Asia as the terminus. Port Arthur, however, washed by the warmer waters of the Yellow Sea, now became the coveted goal.

A corporation known as the Russo-Chinese Bank was established, which to all appearances was a mutual combination of Russian and Chinese capital. Although the bank was only another name for the Department of Finance of the Russian empire, yet its name pleased Mongolian vanity and won respect, the Chinaman having as great esteem for a banker as he has contempt for a soldier.

There were times when China was short of ready cash, and the Russo-Chinese Bank each time went to her aid. Therefore when China was asked to grant a concession for a railroad from the Siberian trunk line to Liao-Tung Bay, and the Russo-Chinese Bank offered to furnish the necessary $250,000,000, China could not well refuse. With the same discretion with which the bank was named, the railroad was called the Russo-Chinese railroad. On its stationery were the grouped flags of China and Russia. These flags also appeared on the cars and engines, and on days of popular festivity they floated over the depots.

After the road was built some Chinese awakened to the railroad's true purpose. They discovered that it penetrated the most fertile as well as the most densely populated districts of Manchuria, and had for its terminus the Russian fortress of Port Arthur. On the north it joined with the Siberian trunk line at Harbin, on the mighty Sungara. It passed through the cities of Tsitsihar, Kirin and Mukden, capitals of the three Manchurian provinces. It tapped the Gulf of Liao-Tung, by means of the port of New-Chwang, and skirted the whole eastern coast of this arm of the Yellow Sea.

When the other powers became alarmed at the armies of soldiers which kept pouring in with every train from Siberia and European Russia, the officials of the Czar explained that they were simply «railway guards,» and, to further prove that their presence was wholly warrantable, they pointed to a sentence of the railroad's charter, which permitted Russia to guard the railway with troops, but did not limit their number. Faster than the soldiers, however, came the colonists. Families were gathered from all parts of the Czar's western dominions, and put aboard trains of the Siberian railroad at Cheliabinsk, the border town between European and Asiatic Russia. They were charged nothing for transportation. Their wants were cared for on the way. At each railroad station along the 6,000 miles of track there was hot water and fuel where they might cook, and markets of wooden sheds where they might buy food from the peasants at low cost.

Every inducement now was held out to the Russian settler. To each male member of the household was given 100 acres, and oftentimes a man who had a large number of sons assumed ownership of more than a square mile. In addition to the land the government furnished the settler with agricultural implements, carpenter tools and cattle, and even advanced him money, to be repaid at an insignificant rate of interest. But although immigration amounted to nearly 200,000 a year, it did not penetrate far from the railroad. The region is too vast.

Consequent on the Boxer massacres and troubles of 1900 a Russian military force occupied the right bank of the Amur River, declared it to be Russian territory and established a provisional Russian administration. On 8 April 1902 the Manchurian convention between China and Russia was signed, wherein Russia agreed to evacuate Manchurian territory within 18 months. But Russia could not then voluntarily withdraw. The civilization of the Slav had rooted itself too firmly in this soil to be eradicated except by a political cyclone. One could see everywhere, from Port Arthur at its extreme southern end to the Amur River, the old Russian boundary, on the north, evidences of the Muscovite occupation. Under the direction of Russian engineers native laborers were building railroads and military highways, constructing wharves, marking out vast farms and laying out cities. The Russian fortress was found wherever a strategic site would make Russian cannon still more formidable, and almost in the shadow of these guns rose the peaceful sanctuaries of the Orthodox Greek, with their white walls and green roofs and cupolas.

For the purpose of supplying her thousands of colonists with a great seaport and commercial outlet, Russia had built the city of Dalny (q.v.), 14 miles from Port Arthur, on the eastern side of the Liao-Tung Peninsula. Engineers built its wharves, laid out its streets and even planted trees along driveways intended for pleasure vehicles before the inhabitants arrived. The population grew rapidly and the lines of the steamships which load here directly from the cars of the Siberian railroad increased in number and in frequency of service, while bids were received at Port Arthur by the Russian authorities for the construction of electric light plants and electric railways for Mukden, Harbin and New-Chwang.

On 8 Oct. 1903 the Russian government was pledged to evacuate Manchuria, yet when that day came she only poured in more soldiers, and made a great naval demonstration, her actions creating international uneasiness.

For Japan and Great Britain from political as well as commercial motives, and the United States on account of commercial rights obtained by the Shanghai treaty to trade freely with Manchuria, were particularly interested in insuring the integrity of the Chinese Empire, its administrative control over its Manchurian provinces, and the maintenance of the principle of the «open door.» Furthermore, Russia added to the trouble which was brewing over her continued occupation of Manchuria, by opposing Japan in refusing to allow Korea to open the port of Wi-ju to foreign trade, or to permit Japan to lay a telegraph line from Seoul to Fusan, Russia, however, obtaining from the Korean government, a timber-felling concession south of the Yalu, and also having a telegraph line in working order in Korean territory. Japan had great interests at stake. Russia in Manchuria was a constant menace to the independence of Korea, over the suzerainty of which Japan had successfully fought China in 1894-5.

Japan, in assimilating all that was best of Occidental civilization, had learned all that was worth learning of European diplomacy, and by treaty revision and her correct attitude during the Chinese War and the Boxer troubles, had raised herself and been admitted to the rank of a civilized world power. Soon after Russia, with the aid of France and Germany, had secured a diplomatic victory over Japan in obliging her to withdraw from the Liao-Tung peninsula, which she had occupied by right of conquest over China in 1894–5, Japan had effected a defensive and offensive alliance with Great Britain, whereby that power was pledged to intervene in any future conflict, should any third party again interfere with Japan's political arrangements. Already in July 1893 Japan had opened negotiations with the Russian Government «with a view to a friendly definition of the interests of the two countries in Manchuria and Korea where those interests meet, and thereby to remove every cause of conflict between Japan and Russia.» She now redoubled her efforts in that direction. Russia, it is alleged, unduly delayed her replies, or proposed such amendments as were altogether inconsistent with Japan's idea of an amicable settlement, thus making the situation more and more complicated.

Besides, Russia made great naval and military preparations, despatching all her most powerful war vessels to the extreme Orient and sending military reinforcements to Manchuria and the neighboring regions. Japan, having made all necessary preparations for self-defense, and believing further delay would increase her danger, concluded to break off negotiations with Russia, and accordingly, on 5 Feb. 1904 telegraphic instructions were issued to the Japanese Minister at Saint Petersburg to announce to the Russian Government that Japan had terminated negotiations relative to the proposed Russian convention; that they would take such independent action as they might deem best to defend and consolidate their established rights and legitimate interests, and that they would sever diplomatic relations with Russia and withdraw their legation. The communication was made to the Russian Government the following day.

Russia, on the other hand, claims that her negotiations with Japan were conducted with the object of reaching an amicable and an honorable adjustment of their differences; that she had no reason to expect war, and as a proof of this assertion points out the fact that she was not prepared for war; had she expected war, no consideration would have induced her to withdraw her troops from the Chinese territory and thus lose the opportunity of ending the war quickly. While faithfully adhering to the terms of her treaty regarding Manchuria, she had withdrawn the major part of her troops from that province. Russia claims to be fighting to defend her position in the Far East — for vast interests which it would be foolhardy for her to abandon. Having acquired her present foothold in this Chinese province through the pacific channels of diplomacy and not through the right of military conquest, as is generally supposed, Russia's purpose was to develop Manchuria, and to reclaim an unproductive waste. China, of her own free volition, conferred upon Russia permission to build a railroad through Manchuria to Port Arthur, and it was from Russia that China obtained a loan of $100,000,000 to pay the war indemnity to Japan. Another friendly

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pedo boats made an attack on the unsuspecting Russian fleet in Port Arthur, disabling some of the best ships. Having gained practical control of the sea, the Japanese landed their armies, and by their brilliant naval and land campaigns, early in September 1904, had destroyed Russia's naval supremacy in Asiatic waters, involved Port Arthur in a protracted siege, and had driven the Russian army back on Mukden, the ancient capital of the Manchus and southern Manchuria.

Some of the more striking events of the war by sea were the persistent attempts of the Japanese admiral Togo to block Port Arthur, the blowing up of several Russian ships by mines, especially the destruction of the Petropavlosk 13 April, when the vessel sank with 800 men including Admiral Makaroff, «the Cossack of the sea,» and the war artist Verestchagin; the blowing up of the Japanese battleship Hatsuse, and the ramming of the Yoshimo on 15 May, with great loss of life; the destructive raids of the Russian Vladivostok squadron on Japanese transports, and seizures of neutral vessels chiefly English and German, including the unwarranted sinking of the British ship Knight Commander which led to diplomatic complications with Great Britain; and the practical annihilation of the Vladivostok squadron by the Japanese admiral Kamimura 14 August, when it attempted to co-operate with a sortie of the Port Arthur fleet which also was hopelessly crippled by Admiral Togo, the Russian admiral Wittshoeft being among the killed, and the vessels driven back to Port Arthur, or forced to seek shelter in neutral ports. One in Chefoo harbor resisting a Japanese search party, was seized and taken out from Chinese protection, a breach of neutrality which the Japanese administration defended; while the Novik escaped to Sakhalin island where she was followed and destroyed by two Japanese cruisers.

By land, the Japanese armies led by Gens. Kuroki, Oku, and Nodzu, notwithstanding desperate Russian resistance, were irresistible in their onward progress. After a six days' fight, Kuroki on 1 May forced the passage of the Yalu near Wiju against the Russian general Sassulitch; Oku on 20 May stormed Kinchow and Nanshan hill, driving Gen. Stoessel and the Russians back on Port Arthur, and capturing Dalny; and while Gen. Nodzu beleaguered Port Arthur, Gens. Oku and Kuroki during a three-days' battle at Telissu (Vafangow), 14–16 June, defeated Gen. Stakelberg, whom Gen. Kuropatkin had detached with a force of 30,000 men and sent to the relief of Port Arthur. The Japanese occupied Yinkow, the port of New-Chwang, and on 25 July at Tashi-chao they again defeated the Russians, and occupied New-Chwang, the important treaty-port through which practically all foreign trade enters Manchuria, and an important base for the landing of further Japanese troops and supplies. The Japanese generals were now joined by Field-Marshal Marquis Oyama and his chief of staff Gen. Kodama. The Russians made heroic attempts to retard the Japanese advance, but were forced back on Liao-Yang, which Gen. Kuropatkin, the Russian commander-in-chief, had strongly entrenched and fortified, fully determined here to check the Japanese advance and to repair Russian military prestige. One of the fiercest battles in history began on 30 August, and after three days of the severest fighting, Gen. Kuropatkin, endangered by a successful flanking movement of Gen. Kuroki, was compelled to abandon Liao-Yang, and retire on Mukden, the battle raging incessantly during the five days' retreat.

On 4 Sept. the Japanese army occupied Liao-Yang and began to fortify the city for use as a base of supplies. In the meantime they had completely surrounded Gen. Stakelberg and his force of 30,000 and his retreat had been cut off by Gen. Oku, but on 4 Sept. he finally succeeded in extricating himself and rejoined Kuropatkin, thus leaving the garrison at Port Arthur to defend the city as best it might without hope of a relief force ever reaching the city from the land side.

With the exception of some desultory fighting the armies lay dormant for three weeks, the Russians constantly receiving supplies and fortifying Mukden, while the Japanese intrenched themselves in the positions they had gained.

On 18 Sept. the Japanese began shelling the fortifications around Mukden and launched a series of small attacks against the Russian outposts but with no great gain to them. On 4 Oct. Gen. Kuropatkin assumed the offensive pushing the bulk of his army across the Hun River, along the main road toward the railway station and the Yen-Tai coal mines. Here he was faced by Gens. Oku with the Japanese left guarding the railway, Nodzu with the centre guarding the mines and the main road, and Kuroki with the right ready to flank any forward movement, only awaiting developments to make a dash to cut off retreat and hem the enemy in and thus inflict a crushing defeat. The Russian general evidently planned to break through between the right wing under Kuroki and the centre under Nodzu for the main attacking force was directed against Nodzu's division. This series of engagements, known as the Battle of the Shakhe River, lasted for 11 days from 6–17 Oct. and was marked by even heavier and fiercer fighting than was witnessed at Liao-Yang. The losses to both sides were enormous, though the Russian army was by far the heavier loser, their loss being officially placed at 45,000 killed, wounded, and missing while the Japanese loss was only 15,879. Though the Russian advance had been checked by the 9th, the Japanese were not able to press the advantage, the net result showed no gain to either contestant, and for several weeks after the serious fighting subsided both armies took a much needed rest, beside which the cold weather had set in and made operations extremely difficult.

During these months operations by land and by sea before Port Arthur had been carried on with varying success but the laurels generally resting on the Japanese arms. On 7 Aug. and the few days immediately following the Russian positions on the Taku and Shaku mountains were captured and the Orlung and Keckwan forts occupied. On 4 Sept. the minor forts east of Golden Hill were taken; by 19 Oct. several positions near the Rihlung Mountain had been taken and by the 26th the entire Russian outpost in this vicinity captured. Then for almost a month the operations consisted of small attacks by the besiegers and sorties by the defenders, the final assault of the Japanese resulting in the taking of 203-Meter Hill on 2 Dec. This entailed a loss of over 15,000 men to the Japanese army but enabled them to mount their heaviest siege guns on a hill which commanded both the town and the harbor. This systematic bombardment forced the surrender by Gen. Stoessel, on 2 Jan. 1905, of the entire garrison and the ships within the harbor. The Russians had before the surrender lost about 25,000 men and of the naval force the battleships *Pobieda, Retvizan, Peresviet, Sevastopol,* and *Poltava;* the cruisers *Bayais* and *Pallada;* and the gunboats *Giliak* and *Amur* had been battered and sunk. With the surrender they further lost, in prisoners 23,491 men and 878 officers, including eight generals, four admirals, and 57 colonels, while 80 officers were paroled; 50 permanent forts; 546 large guns; vast quantities of all supplies and munitions of war; and with the destruction of the fleet all hope of gaining the supremacy on the sea. The Japanese loss consisted: in the navy of the battleships *Yashima* and *Hatsuse,* and the cruisers *Nisshin, Saiyen,* and *Miyako* — all by mines; the protected cruiser *Takasago;* the gunboats *Oshima* and *Atago;* and the destroyers *Akatsuhi* and *Hayatori;* in the army of about 50,000 men during the entire operations. They had gained however, beside the supplies for land operations, 4 battleships, 2 cruisers, and 14 gunboats and destroyers, and command of the sea.

With the fall of Port Arthur, fighting was resumed by the armies at Mukden. Gen. Kuropatkin attempted to turn the Japanese left flank in the direction of Liao-Yang but after six days of severe fighting his attack was repulsed with a loss of 15,000, the Japanese loss being placed at 7,000. By the middle of February Marshal Oyama had been reinforced by an army of 100,000 veterans from Port Arthur under Gen. Nogi, who had come by forced marches to the scene of operations in the north. Another army under command of Gen. Kawamura had mysteriously entered the battle arena, having probably been operating under cover of the larger armies, between Kuroki and Vladivostok.

Thus the three armies under Oyama had maintained the same relative positions they had occupied during the march from Hai-Cheng northward. They had however been supplemented by two others: that under Nogi being placed on the west of Oku and forming the extreme left, and by that under Kawamura to the east of Kuroki and constituting the extreme right wing. Briefly stated the Japanese army consisted of the left wing under Oku and Nogi, the centre under Nodzu, and the right under Kuroki and Kawamura; in all a vast body about 400,000 strong, stretching crescent shape over 100 miles of plains and hills from Chang-Tau eastward across the railway to Lone Tree (Putiloff) Hill. The Russian army, numbering about 350,000, occupied all the strong positions and moreover was fighting on ground of its own selection. On 20 Feb. a general advance was made against the Russians, the fighting resolving itself into a game of flanking. Kuroki's right crossed the Sha-ho River, swung across the Russian left, attacked it in the mountains,

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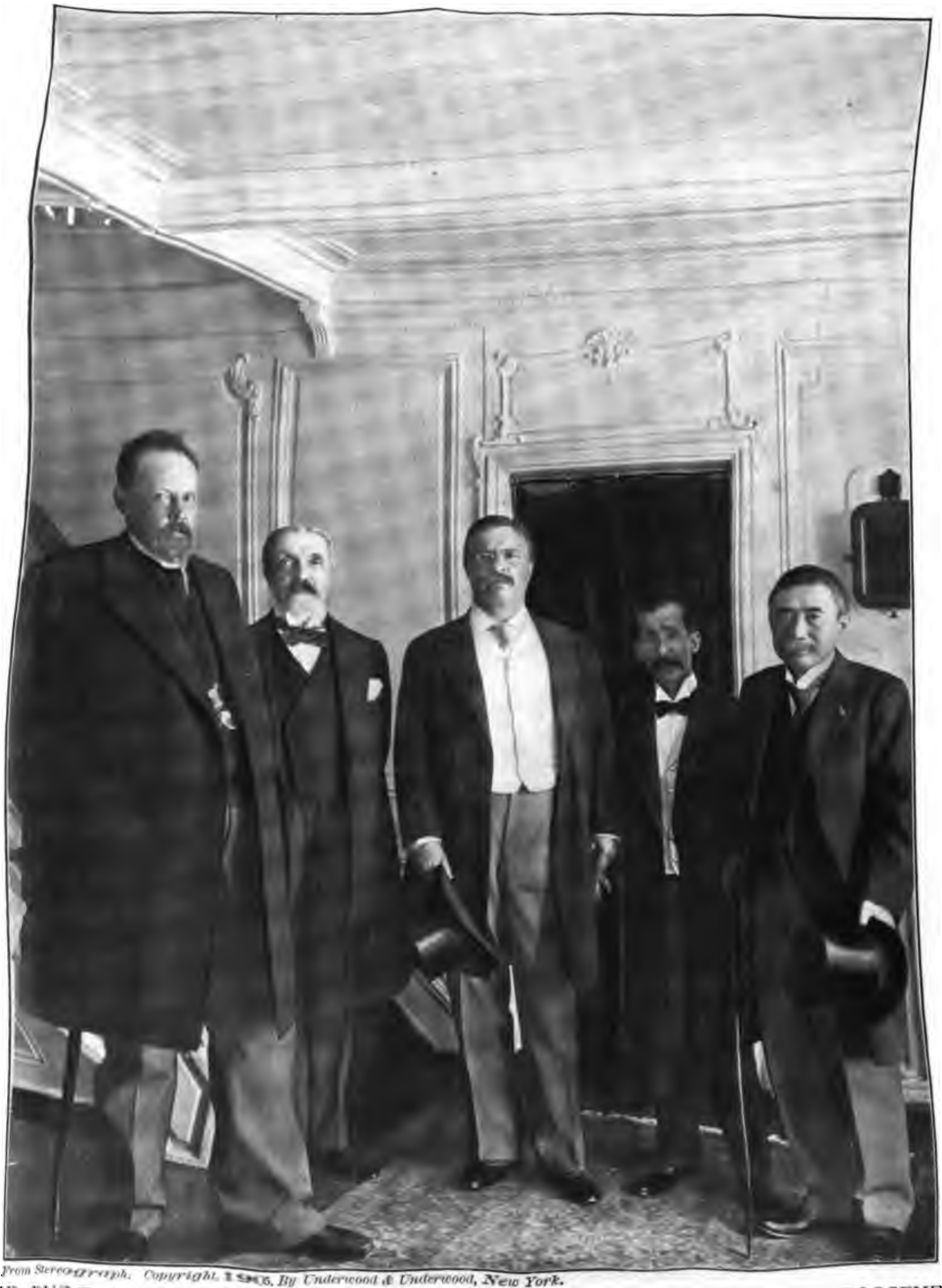

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THE RUSSIAN AND JAPANESE PEACE COMMISSIONERS WITH PRES. ROOSEVELT.
Photographed on the "Mayflower" Aug. 5th, 1905.

ships under his immediate command, the outer line by the cruisers under Kamimura, while the light cruisers under Uriu were to the north on the lookout for stragglers. By a turning movement Togo placed his ships on the west, thus throwing the Russians to the east and placing the sun directly in their eyes. Shortly after 2 o'clock firing began and soon became general.

As the Russian fleet passed Togo's battleships, the squadron of light cruisers under Uriu broke in on them from the north while the heavier cruisers under Kamimura swung around to the south to head off any possible retreat. Thus they were surrounded, by Uriu on the north, Togo on the west, and Kamimura on the south, all, as they pounded them to pieces, driving them toward the coast of Japan. The fire from the Japanese ships was so effective that by Saturday night the battleships *Sissoi Veliki*, and *Borodino* were sunk. During the night the fleet of torpedo boats took up the awful work and when morning broke it was found that the battleships *Kniaz Suvarov, Alexander III, Oslyabya,* and *Navarin,* the coast defense ship *Admiral Oushakov,* the armored cruiser *Dmitri Domskoi* and the protected cruiser *Svietland* had been torpedoed and sunk. On Sunday, the 28th, the armored cruisers *Admiral Nakhimov* and *Vladimir Monomakh,* which had been badly crippled during the night, were torpedoed and sunk near Tsu Island During the morning Admiral Nebogatov, with five ships, attempted to escape to the north but they were overtaken near the Liancourt Islands and surrendered, the captured ships being the battleships *Nicholas I* and the *Orel* and the coast defense ships *Admiral Apraxine* and *Admiral Seniavin*. The other ship, the *Izumrud,* escaped but after running on a reef Monday night was blown up by her commander. Three cruisers, the *Oleg,* the *Aurora* and the *Jemchug,* under Admiral Emquist, escaped and reached Manila 3 June, where they were interned; the cruiser *Almaz* and three destroyers reached Vladivostok in safety; and one destroyer drifted into Shanghai Harbor on 4 June.

Thus it will be seen that the Russian loss foots up as follows: Sunk — six battleships, the *Sissoi Veliki, Borodino, Kniaz Suvarov, Alexander III, Oslyabya,* and *Navarin;* three armored cruisers, the *Dmitri Domskoi, Admiral Nakhimov,* and *Vladimir Monomakh;* two protected cruisers, the *Svietland* and *Izumrud;* the coast defense ship *Admiral Oushakov;* and six destroyers; captured — two battleships, the *Nicholas I,* and the *Orel;* two coast defense ships, the *Admiral Apraxine* and *Admiral Seniavin;* and the destroyer *Biedovy,* on which was Admiral Rojestvensky; beside which the dead numbered over 7,000 and the prisoners over 4,000. The Japanese loss consisted of three torpedo boats; three officers and 113 men killed and 424 wounded. On 30 May Admiral Togo telegraphed that the battle was called the «Battle of the Sea of Japan.»

The campaign on land was again vigorously pushed. On 16 June Liao-Yang Wo Peng, west of the Liao River, was captured and the Russians driven north after suffering a heavy loss. On 7 July the Island of Saghalien was invaded, this marking the first entry upon Russian territory proper, and after a short but vigorous campaign, on 31 July the governor with 70 officers and 3,200 men surrendered, which with 500 surrendered and 200 killed on the 28th makes the total Russian loss on the island about 4,000; the loss to the Japanese was insignificant.

Meantime a sixth army under General Hasegawa began to invest Vladivostok from the west, a force was landed 17 July on the shores of Olga Bay, 150 miles north of the city to attack from that side and on 4 Aug. a fleet began the blockade of Peter the Great Bay on which the city is situated. In this position the armies were on 5 Sept. 1905, but the signing of the treaty of peace put a stop to any further operations.

Yielding to the earnest requests of President Roosevelt to stop the war if possible, both Russia and Japan consented in the latter part of June to hold a conference with peace a possible outcome. Baron J. Komura and Minister Takahira for Japan and Serge Witte and Baron Rosen for Russia were chosen as ambassadors with full powers to arrange terms of peace, and the Portsmouth, N. H., Navy Yard was selected as the meeting place. On 29 Aug. the plenipotentiaries reached a final agreement, the treaty was drafted and signed on 5 Sept.

Manchus, măn-chooz', a name given the reigning family in China, members of whom sat upon the throne of the empire as early as 1644. They belong to the Tungusic type of Mongolians.

Mancini, mān-chē'nē, a name borne by the five nieces of Cardinal Mazarin. They were born in Rome and summoned by their uncle to Paris, where they played a conspicuous part in the court of Louis XIV. during the early years of his reign. They were: (1) Laure (b. 1636; d. 1657), the amiable and pious companion of Louis XIV.'s boyhood. She became the mother of Louis, Duke of Vendôme, one of the greatest generals of the Grand Monarque. (2) Marie (b. 1639; d. about 1715), for whom the king conceived a violent affection, but in 1661 Mazarin gave her in marriage to Prince Colonna, constable of Naples. (3) Olympe (b. 1640; d. 1708), a witty and attractive woman, who became wife of Eugène de Savoie-Carignar, count of Soissons, and mistress of the queen's household. (4) Hortense (b. 1646; d. 1699), the most attractive and beautiful of the Mancini. In 1666 she left her husband, the Duke de Mazarin, and became one of the chief beauties of King Charles II.'s court. The king pensioned her, and after the revolution of 1688 she lived in retirement in Chelsea. (5) Marie Anne (b. 1649; d. 1714) was the wittiest and most vivacious of the sisters. In 1662 she married the Duke de Bouillon, and her salon became the centre of social and intellectual life at Paris. She patronized La Fontaine, Corneille, and Molière. She died in Clichy.

Manco Inca I., ĭng'ka, Peruvian ruler; b. about 1500; d. 1544. He was the second son of the inca Huayna Capac (q.v.), who died about 10 years after the first arrival of the Spaniards, dividing his kingdom between his legitimate successor Huascar and a younger son, Atahualpa. The latter, after having made war upon Huascar, and put him to death, was himself captured and executed in 1533 by Pizarro. Shortly afterward

Manco appeared in the Spanish camp to announce his pretensions to the throne and claim Pizarro's protection. The conqueror received him cordially, and made it his first care after the taking of Cuzco to place him on the throne. After in vain petitioning for power to exercise the sovereignty, he withdrew secretly from Cuzco, but was brought back and imprisoned. Again escaping, he roused the whole nation to arms against the invaders, and appeared before Cuzco (February 1536) with a countless host of Indians who covered the surrounding hills. He destroyed a large part of the city by fire, and reduced the Spaniards to extremities; but after the siege had lasted over five months, had to withdraw on account of the scarcity of food. Defeated subsequently by Almagro, and forsaken by most of his warriors, he fled to the Andes, and for several years maintained his independence sallying forth as occasion offered at the head of a few brave followers, always eluding pursuit in the wilds of the Cordilleras, and in the event of civil war among the foreigners throwing his weight into the weaker scale in order to prolong their contests. He was killed by a party of Spaniards belonging to the younger Almagro's faction, who on the defeat of their leader had taken refuge in the Peruvian camp.

Mandæans, măn'dē'ạnz, an ancient Oriental religious sect of mixed Christian, Jewish, and heathen elements. They are still found on the east shore of the Tigris, working as jewelers, blacksmiths, carpenters, etc. Their religion is a kind of Gnosticism, retaining various Jewish and Parsee elements. They worship a number of personifications, particularly of the attributes or names of God. They publicly call themselves Sabians (*Subbâ,* «baptists»), thus professing to identify themselves with the Sabæans tolerated in the Koran. They were formerly called Christians of St. John the Baptist from their habit of baptism or ablution. They have five important sacred books: 'Sidrâ rabbâ' («the great book»), called also «ginza,» «treasure»; 'Sidrâ de Yahyâ' ('Book of John'); the 'Qolasta,' a collection of hymns; 'Diwân,' a ritual; and 'Asfar Malwâsê,' a manual of astrology. The Mandæans had three degrees in the priesthood, with a supreme official (Rish ammâ) as the source of both civil and ecclesiastical authority. The priests officiate in white robes, barefooted, and women may be admitted to their order.

Mandaites. See Nazarenes.

Mandalay, măn'dạ-lā, East India, capital of Upper Burma; two miles from the left bank of the Irawadi, a little north of Amarapura (q.v.), the former capital, and about 410 miles north of Rangoon. It was founded in 1860, was the capital of independent Burma until its capture by the British in the end of 1885, and since the treaty by which (1886) the king lost his throne it has been the capital of Upper Burma. The area is six square miles. The most famous building in Mandalay is the Aracan Pagoda; it contains a brazen image of Buddha, 12 feet high. In the centre of the town stands what was once King Theebaw's palace. Outside the enclosures of the city was, until the British conquest, a crowded, dirty native town, now cleared away to make room for a British cantonment. The present native quarters lie outside the fortified city. Beyond them, again, on the slopes of the hills that border the valley of the Irawadi,

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Man'darin, the term usually applied in China by foreigners to government officials of every grade. It is supposed to be derived from the Portuguese *mandar,* to command, or from the Sanskrit *mantrin,* counsellor; the Chinese equivalent is *kwan,* which signifies literally a public character. There are nine ranks, distinguished by different buttons.

Mandarin Duck, a small Chinese duck (*Aix galericuta*) closely related to the American wood-duck (*A. sponsa*), and dressed in an exceedingly beautiful plumage of metallic green, purple, chestnut, white and black. It has long been domesticated by the Chinese, and, as it is said to pair for life, is held up by them as a model of marital virtues; and it has been introduced upon park waters and ornamental grounds in America and Europe.

Mandat, mäń-dä, the name given to a kind of paper-money in the French Revolution. After the assignats, which had been kept in circulation by the violence of Robespierre, had lost all credit, a new money was created — the mandats — founded, like the assignats on the credit derived from the confiscated property, but with the essential difference that specific pieces of property, enumerated in a table, were pledged for the redemption of the bills, while the assignats furnished only a general claim. These mandats were issued in accordance with the law of 1796, to the nominal value of $480,000,000. A forced circulation was given to them, by which the government was enabled to defray the expenses of the approaching campaign.

Mandate, in law, a term derived from the Roman civil law. It may be defined as a bailment (delivery) of a chattel or chattels to a person who is to do something with or about the things bailed, entirely without compensation. The essential element of the contract lies in the fact that there is not paid or promised, in law or in fact, any compensation whatever for the service to be rendered. The person delivering the chattels is called a mandator; and the person receiving them and undertaking the service is called a mandatary. As it must be a service or an act, the whole benefit of which rests with the mandator, this, by the ordinary principles of bailment, determines the amount of care to which the mandatary is bound, and the degree of negligence for which he is answerable. For negligence in a bailee has in law three degrees: slight negligence, which makes the bailee responsible where the bailment was wholly for his benefit; ordinary negligence, for which he is responsible if the bailment be for the benefit of both parties; and gross negligence, for which only the bailee is responsible where the contract is for the exclusive benefit of the bailor. And as it is not a mandate if the bailee derives any benefit whatever from the service, it follows that a mandatary is responsible for loss of or for injury to the thing delivered to him, only when it is caused by his gross negligence. There is no especial form for the contract of mandate; it may be in writing or by word only, and made very solemnly or in the simplest way; in either case the law is the same. No man can be held in the United States for a breach of any promise, whether that breach be partial or total, if the promise rests upon no consideration. But if he who has made a promise, afterward does some injury to the promisee (and this would be the case if he does something which is positively injurious because it is not completed), he is liable for the injury he has caused, as he would be if there were no promise between the parties. Banks and bankers are so far mandataries, that they receive notes for collection, and render, or engage to render, by agreement or by mercantile usage, these and similar services without any especial or specific compensation. But it is understood that they do this as a part of their business, and for the general and indirect benefit they derive from doing it; and this is undoubtedly consideration enough to make them liable for any injury to their customer caused by their negligence; and it is sufficient to make them liable that their negligence was ordinary, or consisted in the want of common care. And a bank has, as bailee, a lien on its deposits for its general balance against the depositor.

Mandaue, män-dä'wä, Philippines, a pueblo of the province of Cebú, situated on the east coast, on the north shore of Cebú Channel, five miles northeast of the town of Cebú; it is on the coast road. Pop. 15,300.

Mandaya, män-dä'yä, a Philippine tribe of the Malay race living in the commandancia of Bislig, and the district of Dávao, island of Mindanao. They are bloodthirsty, and head-hunters, mostly heathen, though Jesuit missionaries have converted some to Christianity. See PHILIPPINE ISLANDS.

Mandel, män'dĕl, **Eduard,** German engraver: b. Berlin 15 Feb. 1810; d. there 20 Oct. 1882. He studied in Paris with Henriquel-Dupont, and in 1842 became professor of engraving at the Berlin Academy. He was one of the greatest of modern German engravers, the most important work of his being the plate of Raphael's ‹Madonna di San Sisto,› his latest effort. Consult Pietsch, ‹Eduard Mandel und seine Werke› (1883).

Man'derson, Charles Frederick, American lawyer and politician: b. Philadelphia 9 Feb. 1837. He received his early education in Philadelphia, removed to Canton, Ohio, in 1856, studied law and was admitted to the bar in 1859. He was city attorney in Canton 1860–1; at the outbreak of the Civil War he enlisted as a private in the Union army, served in the campaigns in the Middle West, and rose through the intermediate grades to the rank of brigadier-general of volunteers. He was severely wounded at the battle of Lovejoy's Station, Ga., and resigned from the army in 1865 on account of his wounds. He resumed his law practice in Stark County, Ohio, but removed to Omaha, Neb., in 1869. Here he soon became prominent in public affairs, was city attorney for more than six years, and a member of the Nebraska constitutional conventions in 1871 and 1874. In 1883 he was elected to the United States Senate, serving until 1895, and being chosen speaker pro tem in two Congresses, 1889–93. Since 1895 he has been solicitor for the Burlington system of railroads, west of the Mississippi; and was president of the American Bar Association in 1900–1. He has published ‹The Twin Seven Shooters› (1902), and several addresses on political and legal subjects.

Mandeville, Sir John, English traveler and author of a book of travels in Asia and Africa. It was originally written in French, between 1357 and 1371. An English version was made from the French MSS. about the beginning of the 15th century. That part of the book which treats of the Holy Land may be a record of the author's experience; but the greater part is taken from the travels of the friar Odoric, written about 1330, and from other sources. A good edition of these travels, entitled the 'Voiage and Travaile of Sir John Mandeville, Knight,' is that of Halliwell (1839), a reprint of the edition of 1725, which was taken from a MS. of the 14th century in the Cotton Library, written in the Midland dialect. Another text was first printed for the Roxburghe Club in 1889. The first printed English edition is that of Wynkyn de Worde (1499). Mandeville had long the reputation of being the «father of English prose.» He was said to have been born at St. Albans about 1300, set out on his travels in 1322, returned in 1357, died, and was buried at Liège; but these statements are untrustworthy, and the very name of the compiler of the travels is doubtful.

Mandingoes, măn-dĕng'gōz, a native tribe of West Africa, remarkable for their intelligence. The original country of this people was the north slope of the high table-land of Senegambia, between the head-waters of the Niger and Senegal. Their language is more widely diffused, and more employed by translators, than that of any of the other languages of West Africa. They formed at one time a single large empire, but are now widely scattered. Their religion is Mohammedan.

Man'dolin, a musical instrument, belonging to the lute species, played with a quill or plectrum as well as with the finger. It is of Italian origin, but latterly has become common in all civilized countries. In the usual form it has four pairs of metallic strings and a fingerboard or neck with numerous frets across it. Operatic composers have occasionally employed the mandolin to obtain characteristic effects.

Man'drake, a genus of perennial herbs (*Mandragora*) of the order *Solanaceæ*. The species, of which only three are described, are almost stemless, thick-rooted, and large-leaved, with rather large whitish or bluish bell-shaped flowers, followed by globular berries. The plant is chiefly interesting from the numerous allusions to it in old writings, the superstitions relating to it being mainly in connection with its fetid, reputedly poisonous root, which, from a fanciful resemblance of its roots to the human figure, was considered an aphrodisiac.

The May-apple (*Podophyllum peltatum*), of the order *Berberidaceæ*, is often called «mandrake» in the United States, where it is common east of the Mississippi River. It is a perennial herb which sends up umbrella-shaped leaves, usually two at the summit of a stem and bearing one or two creamy, fragrant flowers in the axil. A mawkish yellow fruit about the size of a large cherry develops during early summer. The fruits «are relished by pigs and boys.» The creeping rootstocks have been used medicinally.

Man'drill, the largest, and one of the most repulsive and savage of the African baboons. See Baboon and compare Drill.

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brittle, lustrous metal, susceptible of taking a high polish, and resembling iron in most respects, both physically and chemically. It is not magnetic, however. The pure metal does not appear to be affected by dry air, but moist air oxidizes it, at least superficially. Some authorities describe it as oxidizing readily in common air, and as decomposing water with almost as great a facility as potassium; but it appears probable that the specimens from which these results were obtained contained impurities of some sort. Metallic manganese is not used in the arts, but some of its alloys with iron, aluminum and copper are valuable. It is particularly valuable in steel, its presence in small amount increasing the hardness, tenacity and elasticity of the metal. It is added to the molten steel, in the process of manufacture, in the form of an iron-manganese alloy containing from 10 to 80 per cent of the latter metal, and known in the arts as «spiegeleisen» or «ferromanganese.» The «manganese» of commerce is usually not the metal itself, but a mixture of its oxids.

Chemically, manganese is a dyad. It has the symbol Mn, and an atomic weight of 55 if $O = 16$, or 54.6 if $H = 1$. It forms numerous oxids, the best known of which are (1) the monoxid, MnO, from which the manganous salts may be prepared, and which is itself obtained by heating manganese carbonate out of contact with the air; (2) the sesquioxid, Mn_2O_3, which exists in nature as the mineral braunite, and which is also formed when the monoxid is heated in air to a red heat; (3) the red or mangano-manganic oxid, Mn_3O_4, which corresponds to the magnetic oxid of iron, does not form salts, and exists in nature as the mineral hausmannite; (4) the black oxid, or dioxid, MnO_2, which occurs in nature as pyrolusite and varvacite, and which is largely used in the arts in the preparation of oxygen and chlorine; (5) the trioxid, MnO_3, which is difficult of preparation and very unstable; and (6) the heptoxid, Mn_2O_7, a heavy, dark green liquid, prepared by treating potassium permanganate with cold concentrated sulphuric acid. Several of these oxids also occur in a hydrated form, as minerals. Of the soluble manganous salts, the chief representatives are the sulphate and the chloride. Manganous sulphate, $MnSO_4$, is prepared by treating the dioxid with sulphuric acid, oxygen being liberated at the same time in accordance with the equation $MnO_2 + H_2SO_4 = MnSO_4 + O + H_2O$. It crystallizes with five molecules of water, as a pink-colored salt, and is used in dyeing and in medicine. The chloride, $MnCl_2$, crystallizes with four molecules of water, and is obtained as a by-product in the manufacture of chlorine by the action of hydrochloric acid upon manganese dioxid. It is used in calico printing. Of the insoluble manganese salts we may specially note the sulphid and the carbonate. The sulphid, MnS, is thrown down as a flesh-colored precipitate, when a soluble manganous salt is precipitated by an alkaline sulphid. The carbonate, $MnCO_3$, occurs native as the mineral rhodochrosite, and it may also be obtained as a white precipitate by adding an alkaline carbonate to a solution of manganous sulphate or chloride.

Two other important classes of manganese compounds are known, in which the manganese does not act as a base, but as an acid-forming element. These are the manganates and per-
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Manguianes, măn-gē-änz', the natives of the interior of Mindoro, Romblon and Tablas (qq.v.), Philippines; they are divided into four branches, one of which is of Negrito blood, another is Mongoloid, and the other two are of the Malayan race. There are several tribes, including the Bangot, the Buquil, etc. The term is also used in the island of Palawan to designate all wild natives of unknown origin.

Mangum, măng'gŭm, **Willie Person**, American legislator: b. Orange County, N. C., 1792; d. Red Mountain, N. C., 14 Sept. 1861. He was graduated from the University of North Carolina in 1815, was admitted to the bar in 1817, in 1818 was a member from Orange County of the lower house of the State legislature, and in 1819 became a judge of the superior court. From 1 Dec. 1823 to 18 March 1826 he was a Whig representative in the 18th and 19th Congresses; but this post he resigned, and again he was elected a judge of the superior court. He retired from the court in 1826, but filled the office a third time in 1828–30. He was a United States senator from 5 Dec. 1831 to 1836, when he resigned, and from 9 Dec. 1840 to 3 March 1853; and in 1842–5 was president *pro tempore* of the Senate. Throughout nearly his entire term of service in Congress he was a leader of the Whigs; and in 1837 he received the 11 electoral votes from South Carolina for the presidency of the United States.

Manhat'tan, one of the boroughs comprising the city of New York. See NEW YORK CITY.

Manhattan, Kan., city, county-seat of Riley County; on the Kansas River, at the junction of the Big Blue, and on the Chicago, R. I. & P. and the Union P. R.R.'s; about 55 miles west of Topeka. The surrounding region is mainly agricultural; limestone quarries are in the vicinity. The chief industrial establishments are a foundry, machine shops, flour mills, lumber and brick yards. Manhattan is the trade centre for a large section and ships live-stock, grain, and limestone. The city owns and operates the waterworks. Pop. (1900) 3,438.

Manhattan College, an institution in Manhattan borough of New York city directed by the Christian Brothers. It was opened originally (1849) as an academy for young men, under the name of the Academy of the Holy Name, but the constant increase of the student body and the consequent demand for higher branches of study forced the academy to adopt the college courses, which was done in 1853, the academy being then incorporated under the name of Manhattan College. The courses lead to the degrees of B.A., M.A., B.S., and C.E. The resources of the college are derived from tuition only, there being no endowment. The institution reported at the end of 1903: professors and instructors, 25; students, 394; volumes in library, 9,459; value of grounds and buildings, $625,000; income, $47,000; number of graduates, 932.

Manhattan Island. See NEW YORK CITY.

Mani, mä'nē, the founder of the sect of Manichæans. See MANICHÆANS.

Man'ia. See INSANITY.

Manicaland, mä-nē'ka-lănd, South Africa, a portion of southern Rhodesia, situated on the border of Portuguese East Africa, east of
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critique du Manichéisme’ (1734); and Harnack, ‘History of Dogma’ (1897).

Manifes'to, in international law, a declaration publicly issued at the commencement of a war by the contending powers to show the causes which justify such a measure. Manifestoes are in the form of public letters; they commence with a short address to the public in general, and are signed with the name of the person who issues them. See LAW, INTERNATIONAL.

Manifolds, Theory of. See ASSEMBLAGES, GENERAL THEORY OF.

Man'igault, Arthur Middleton, American soldier: b. Charleston, S. C., October 1824; d. 16 Aug. 1886. In 1846 he was elected 1st lieutenant of the Charleston company in the «Palmetto» regiment for the Mexican War, throughout which he served. In June 1861 he was elected colonel of the 10th regiment, South Carolina infantry, and in 1861–2 was in command of the 1st South Carolina military district. From the early part of 1862 he served in the army of the West successively under Bragg, Johnston, and Hood, in 1862 was placed in command of a brigade, and in 1863 made brigadier-general. At Chickamauga he distinguished himself by his repeated assaults, and in the retreat before Sherman's invasion he did some vigorous fighting. His death was hastened by a wound received in the battle of Franklin, Tenn. (30 Nov. 1864). Subsequent to the war he was elected by the Democrats adjutant-general of South Carolina, served by two re-elections until his death, and at that time was a candidate for a fourth term.

Man'ihot. See CASSAVA.

Manila, mạ-nĭl'ạ or mä-nē'lä, the capital of the Philippine Islands, the principal city of Luzon as well as of the archipelago, situated in lat. 14° 35′ 31″ N. by lon. 120° 58′ 08″ E., lies on both sides of the Pasig River, and has a frontage of four miles on the bay of Manila. The corporate jurisdiction for police purposes extends three miles from the shore over Manila Bay, making the total area under the police jurisdiction of the city 32 square miles or 20 square miles on land, and 12 on the bay. The name of the city is a corrupt form of a Tagalog word, originally written «Maynila,» and means a species of shrub or bush which formerly grew on the site of the city. It is now applied not merely to the town within the walls, but to the whole region and the inhabitants included within the corporate limits. The most important divisions of the city are the walled town, particularly known as Manila, on the left bank of the river and Binondo on the right bank. Other districts, formerly more independent than at present, have retained their names and some degree of individuality. Immediately south of the walled town lies Ermita; farther on along the shore is Malate; and inland directly east of these lie Paco, Pandacan, and Santa Ana. The most northern district on the shore of the bay is Tondo, and between this district and the lower part and mouth of the river lies San Nicolas. The other districts north of the Pasig are Quiapo, San Miguel, Sampaloc, Santa Cruz, and Trozo.

The walled town was occupied chiefly by the members of the Spanish colony. Its streets are straight and run at right angles with one another, dividing the area within the wall into 54 blocks. The buildings have usually two stories, and are built like the houses of Spanish cities. It contains the cathedral, the principal religious houses and churches of the ecclesiastical orders, various schools, the University of St. Thomas, the hospital of San Juan de Dios, the mint, and the building known as the palace containing the offices of the government. The most imposing of these is the cathedral, a Roman Byzantine structure, which occupies a part of the site of the cathedral destroyed by the earthquake of 1880.

The north wall of the town extends along the bank of the Pasig. Around the outside of the rest of the wall, runs a moat receiving water from the river just east of the town and emptying into the river just west of it. Until 1852 the drawbridges across the moat at the several gates were raised every evening at 11 o'clock, and lowered in the morning at 4. Since then it has not been customary to close the gates.

Only a few of the streets of Manila, of which there are about 80 miles, are paved. The rest are macadamized. European and American retail shops occupy the Escolta, in Binondo. The street called Rosario is almost entirely given up to Chinese shops. The wholesale houses and the banks occupy the district north of the Pasig and west of the Bridge of Spain.

Miguel Lopez de Legaspi established Spanish authority at Manila in 1571, by a treaty with Lacandola, Rajah of Maynila, which was confirmed by the compact of blood made between the contracting parties. On 3 June 1571, he conferred upon Manila the title of «distinguished and ever loyal city.» This title was subsequently confirmed by royal decree. He also gave the city a municipal organization, by appointing two *alcaldes*, one *aguacil mayor*, and twelve *regidores*. He also appointed one notary for the *cabildo*, or corporation, and two notaries public for the court of the alcaldes. Later there were only eight regidores, but in addition a registrar and a constable. The alcaldes were justices, and were elected annually from the householders by the corporation. The regidores were aldermen and with the registrar and constable held office permanently as a proprietary right. The permanent positions in the cabildo could be bought and sold or inherited. This form of organization was maintained throughout the Spanish period.

In 1578 the church and all the inhabitants of Manila were separated from the jurisdiction of the archbishop of Mexico, and the church was erected into a cathedral, but the new bishop was subject to the archbishop of Mexico. On account of the long time needed to communicate between Spain and the Philippines the king ordered the governor of the islands to fill vacancies in the cathedral whenever they might occur.

As early as the beginning of the 17th century the city of Manila was surrounded by a wall of hewn stone about three miles in circuit. It contained a college conducted by the Jesuits, a school for girls called the Santa Potenciana, two hospitals, one for Spaniards and one for Filipinos, a house of mercy for receiving sick slaves and furnishing lodgings to poor women, and a hospital for Chinese. At this time there were within the walls about 600 houses built of stone and mostly occupied by Spaniards. There were also about 2,000 Chinese, with 200 shops, and a garrison of 200 soldiers.

In the war between England and Spain, in 1762, Vice Admiral Samuel Cornish was ordered to proceed against Manila. He carried British and Sepoy forces under Sir William Draper. On 6 Oct. 1762 Archbishop Rajo, as acting governor, surrendered the city, agreeing to pay the British an indemnity of $4,000,000. Only a part of this was paid. The affairs of Manila were administered by the British military authorities until 10 Feb. 1763. After this Manila remained uninterruptedly under the control of the Spanish until 13 Aug. 1898, when it was surrendered to the authorities of the United States. On 20 August the military government opened the custom-house for business, continuing in force the Spanish tariff and customs regulations. In 1899 the Filipinos in insurrection made several attempts to destroy the city. The attempts on 4 and 22 February resulted disastrously to the insurrectos. A similar undertaking was planned for the occasion of General Lawton's funeral.

The political relation of Manila to the central government of the islands is not greatly unlike that which Washington holds to the Federal government of the United States. The city was incorporated by an act passed by the United States Philippine Commission on 31 July 1901. This act vests the government in a municipal board of three members appointed by the civil governor, with the advice and consent of the Commission. The municipal board has certain legislative and executive authority. The organic act provides also for a secretary and other officers, and prescribes their powers and duties. Appropriations for city purposes are made by the Commission on estimates submitted by the board. Thirty per cent of the expenses of the city are paid by the central government, and the balance is met by funds derived from city taxes. All moneys collected in the city are paid into the Insular Treasury, and are there subject to appropriation by the Commission. All municipal accounts of receipts and expenditures are examined by the Insular Auditor.

Vessels approaching Manila by sea from the northwest first sight the Capones Grande light off the southwest coast of Zambales. Vessels from the ports of Indo-China first sight the Corregidor light in the centre. Vessels from Singapore, Java, India, Borneo, and all the southern ports of the Philippine Islands sight the Cabra Island light. All converge on the Corregidor light at the entrance of the bay.

The inhabitants of Manila number 297,154, consisting of 218,900 Filipinos, 60,680 Chinese, 7,852 foreigners, 6,462 Americans, and 3,260 members of the United States army.

Water for Manila is distributed from a reservoir consisting of intersecting tunnels in a low hill about three miles from the city. The reservoir is supplied by pumping the water from the Maraquina River at a point three miles farther away. The waterworks are owned by the city, having been constructed with funds received as a legacy from Francisco Carriedo, who died in 1743. The amount of water consumed in Manila was in 1897, 6,441,011 cubic metres; in 1
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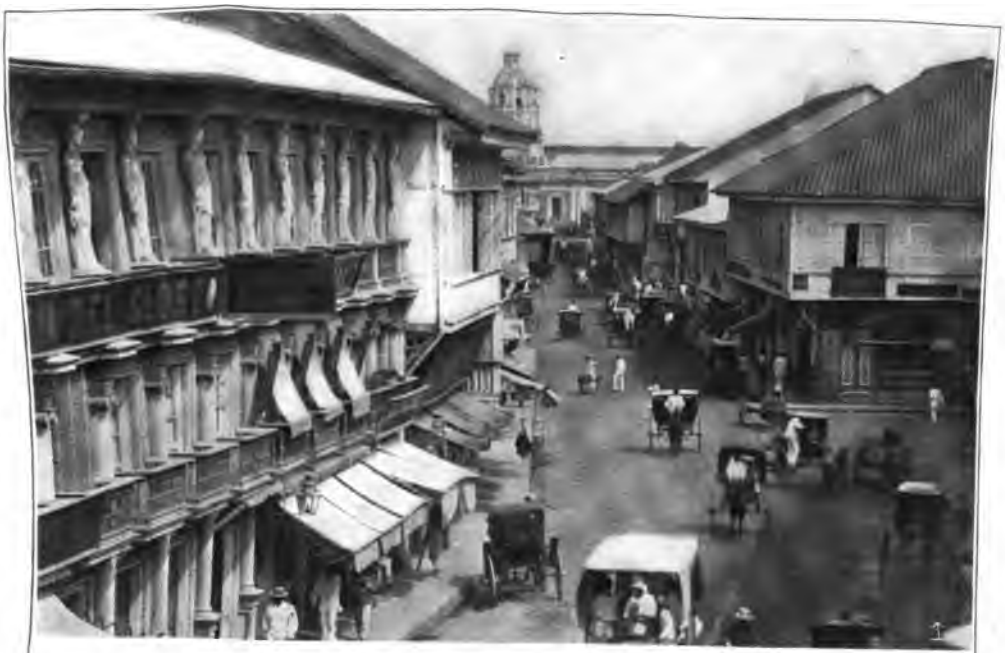

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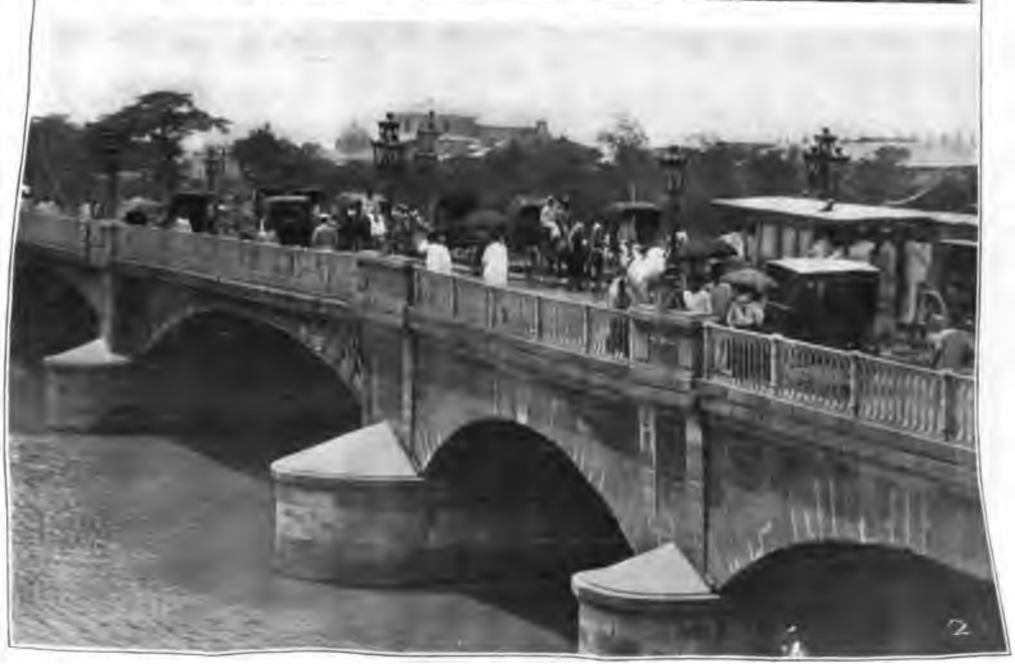

2. The Bridge of Spain.

the stalk or trunk of the wild plantain of the Philippine Islands, and is classed as a structural fibre. The strongest and best of our hard cordage fibres, it is employed in the United States for standard binder twine, and for all sizes of rope from the smallest dimensions to hawsers and cables. The old rope and the waste are employed as paper stock. The fibre is creamy white to reddish white, lustrous, easily separated, stiff and resistant, while its lightness makes it advantageous for employment in cordage for the rigging and running ropes of ships. Structurally the bundles of fibres are very large, but easily separated into fibres of even diameter; the walls of the cells are of uniform thickness, growing slender toward the ends gradually and regularly. In breakage tests for textile strength, with English hemp — made by the British government — Manila stood a strain of 4,669 pounds against 3,885 pounds for hemp, ropes 3¼ inches in circumference and 2 fathoms long being used in each test. In the Philippine Islands the finer grades of the fibre are extensively used for fabric manufacture, the product being worn by the natives of both sexes throughout the archipelago. Mixed with cotton a durable fabric is produced well adapted to the climatic conditions of the islands. According to a recent report of the Philippine Bureau of Agriculture, the manila hemp plant was introduced into India in 1859, and the Andaman Islands in 1873. The plant is also said to be found in Borneo and Java, and attempts have been made to introduce it into other countries. It remains a fact, however, that the commercial fibre is produced only in the Philippines. The culture has been attempted without success in the West Indies, and seed was imported for trial in Florida only a few years ago, by the writer, but it failed to germinate. Several species of banana yielding fair fibre are successfully cultivated throughout tropical and sub-tropical America, and in many other portions of the world. Banana fibre bears no comparison, however, with the Manila hemp of commerce, although the fibre of *Musa basjos* is produced commercially in Japan where it is employed for undergarments for summer wear, as well as for light dresses for the higher classes of Japanese.

Manila hemp first attracted attention commercially early in the last century, and was imported into Salem, and Boston, Mass., about 1824; samples of the fibre, however, were brought to this country by naval officers as early as 1820. The production of the textile had reached about 8,000 tons in 1840, 30,000 tons in 1860, and 50,000 tons in 1880. In 1900 the production was nearly 90,000 tons, and at the present time represents over 62 per cent of the Philippine exports. The United States consumed last year 56,455 tons of the fibre, valued at $10,558,381.

Regarding the specific localities of production and details of cultivation, preparation, etc., the student is referred to Bulletin of the Royal Gardens Kew (August 1894), to a Descriptive Catalogue of Useful Fibre Plants of the World (Washington 1897), and to Farmer's Bulletin (No. 4, pub. 1903), by the Philippine Bureau of Agriculture, Manila.

The extraction of the fibre is a simple proposition. The *abaca* is cut near the roots when the plant is two to four years old, and just before blossoming; if cut earlier the fibre is finer but shorter. After striking off the leaves the trunk or stem is slit from end to end, and the sheathing layers of cellular matter, which form the petioles of the leaves are separated, dried a day or two and then cut into strips three inches wide, and finally scraped until the fibre has been cleaned of all extraneous matters, soft cellular tissue, etc. The bundles of wet fibre are shaken into filaments, washed, dried and sorted. This is the export fibre for cordage purposes, the fabric fibre necessitating further treatment by beating, which softens and subdivides the filaments. The export fibre is wrought into hanks and made into bales of about 270 pounds, when it is ready for shipment. Attempts to use machinery for extracting the fibre have not been successful, partly because the machines have not been adequate, and partly on account of native prejudice. There is great waste by the hand methods of preparation which it is thought machine extraction would obviate. See FIBRE; HEMP; JUTE; RAMIE; SISAL.

CHAS. RICHARDS DODGE.

Manila, University of, founded in 1585 by Philip II. of Spain. Later branches or affiliated schools were founded in different parts of the island. A seminary for the sons of Spanish nobles was opened in 1601, and 10 years later departments were added for the sons of those not belonging to the nobility and for the natives. The university was reorganized in 1857. The departments are science, classics, law, medicine, theology, philosophy, pharmacy, arts and music. The usual degrees are granted. In 1901 there were over 1,000 students in attendance.

Manin, mä-nēn', **Daniele,** Italian patriot: b. Venice 13 May 1804; d. Paris 22 Sept. 1857. He studied at the University of Padua, was admitted to the doctorate of laws, and practised at the bar. In politics he became the leader of the liberal class, and by 1847 had secured a solid reputation as a political economist. For anti-Austrian utterances made during that year and the next he was twice imprisoned, but while awaiting trial was set free by the populace upon arrival of news of the revolution of 1848 in Italy and France, was made President of the Republic of Saint Mark, and given supreme power as head of the patriotic revolt. The Austrians were driven out, and during the siege, which began in the autumn of 1848 and lasted 12 months, Manin was at the head of the civil government, and to his counsels and patriotic spirit it was mainly owing that the Venetians maintained so long and brilliant a defense. After the capitulation Manin retired to Paris, where he maintained himself by giving lessons in Italian, and continued in various pamphlets and through the press to advocate the cause of Italian independence. Consult Martin, 'Daniel Manin and Venice in 1848–9.'

Ma'nioc, or **Mandioc.** See CASSAVA.

Man'iple, (1) one of the divisions of the ancient Roman army. It consisted of 60 rank and file, two officers called centuriones, and one standard-bearer called vexillarius. (2) In the Roman Catholic ritual a sacred vestment attached to the left arm, to leave the right at liberty for ministering.

Manipur, măn-ĭ-poor', northeast India, a native state consisting principally of an extensive valley situated in the heart of the mountainous country which lies between Assam, Cachar, Burma, and Chittagong; area, 8,300 square miles. The greater part of the state is covered with forest and jungle, and the wild animals include the elephant, rhinoceros, tiger, leopard, bear, deer, and buffalo. The people belong to the Mongolian race. They are governed by a rajah, at whose court resides a British political agent under the control of the chief commissioner of Assam. The capital is Manipur; pop. (1901) 67,093. Most of the work is done by the Manipuri women, the men being lazy. The chief crop is rice. There is a special breed of ponies in the country, which are much employed in the game of polo, the national sport of Manipur. There has been a political agent in Manipur since 1835. In 1891, in an outbreak headed by a member of the reigning family, the chief commissioner of Assam and the political agent were murdered; but the disturbance was soon put down and avenged. Pop. (1901) 283,957. Consult Grimwood, 'Three Years in Manipur' (1891).

Ma'nis, Pangolin, or **Scaly Ant-eater,** an edentate mammal, belonging to the group *Squamata,* co-extensive with which is the family *Manidæ.* The body and long, thick tail are covered with horny, imbricated scales. The legs are short and very strong, and the toes are armed with powerful claws, enabling the animals to burrow rapidly. These animals can roll themselves into a ball, and are then protected by their scales, and they exhibit remarkable strength in holding their bodies in this protective attitude. The scales are regarded as formed of agglutinated hairs; and in the Asiatic species true hairs grow between the scales and extend beyond them. All dwell in burrows, come abroad only at night and subsist almost altogether on ants and termites, which they capture by means of their long, rope-like, sticky tongues. They have no trace of teeth; and in general structure show a close resemblance to the American ant-eaters. The latest review of the family shows that it contains seven species, scattered through Africa and tropical Asia, all referable to the genus *Manis.* The best-known species is probably the Indian pangolin (*M. pentadactyla*), which is about two feet long. See Beddard, 'Mammalia' (1902).

Manistee, măn-ĭs-tē', Mich., city, county-seat of Manistee County, on Lake Michigan, and the Manistee River, and on the Manistee & N. E., the Pere Marquette, and Manistee & G. R. R.R.'s.

History.— Its name is derived from the river which passes through it, and was so called by the Indians before the white man came to this vicinity. The Indian interpretation of the word Manistee is «The Spirit of the Woods.» The Chippewas, and portions of the Tawas and Ottawa tribes, are said to have inhabited this region when in its primitive state. Father Marquette (q.v.), in his explorations over 200 years ago, doubtless visited this locality, and was probably the first white man who ever trod this soil. A mission house is said to have been built here in 1826 but not until 1830 have we positive proof of the white man's presence. In 1832 a party of white men landed here and proceeded up the river. In 1833 Captain Humphrey came to the mouth of the river with machinery for a mill, but the water

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and Manistee was practically cut off from communication with the outside world until 1861 when arrangements were made whereby mail was brought overland from Grand Haven once a week. At this time Manistee's population numbered but 1,000 persons, and between the Civil War and a disastrous fire its progress was greatly retarded. After the close of the war things became more prosperous. In 1869 the town outgrew itself and became a city, with 3,343 inhabitants. Manistee was again visited by fire, 8 Oct. 1871, and almost entirely destroyed, but with great energy the citizens began the work of reconstruction which resulted in the Manistee of to-day. Its western confines are bounded by Lake Michigan. On the southeast is Lake Manistee, 5 miles in length and 1½ miles wide. Its waters, of great depth, afford the finest harbor and commercial facilities, and passing through the centre of the city, a distance of 1½ miles, and uniting the two lakes, is Manistee River, 175 feet wide, with a minimum depth of 12½ feet and a current running about 4 miles an hour. Its waters, never closed by ice, are navigable the entire year, making the best winter harbor on Lake Michigan.

Industries, etc.— With the exception of Chicago and Milwaukee, Manistee is the largest shipping port on Lake Michigan. The total number of vessels entered and cleared from this port in 1903, was 1,100 and their combined tonnage was 435,820. Of this, there were 393,806 tons of salt, and 134,382,000 feet of lumber, besides the large quantities of both that were shipped by rail. Manistee's chief industries are the manufacture of salt and lumber. Underlying here at a depth of more than 1,900 feet is a strata of rock salt 32 feet in depth, and from wells 2,000 feet deep, with an opening of but six inches in diameter, is pumped brine, from which immense quantities of salt is manufactured. Two and one half million barrels of salt are shipped from here annually. To better understand the magnitude of this industry, if these barrels were laid end to end, it would make a continuous line 1,262 miles in length. The Buckley & Douglas Salt block is the largest under one roof in the world. Brine from these wells is also of great value in the treatment of rheumatism, and many other diseases, people coming from great distances to avail themselves of the efficacy of the brine baths. Four lines of passenger steamers connect the city with Chicago, Milwaukee, and points north. Four railroads centre here. The Manistee & Northeastern, connecting the city with the north and east, the Pere Marquette, Manistee & Luther, and Manistee & Grand Rapids, with the south and east. There are two telegraph lines, a telephone exchange, the Holly system of waterworks, with 23 miles of mains, 14 miles of electric street railway, over 42 miles of streets, two daily papers, six weeklies, one of which is printed in Swedish, and one in German.

Education.— We have six modern and well-equipped school buildings in our public school system, besides six parish schools, a Carnegie library, 16 churches and 2 missions.

Parks.— Orchard Beach, situated 2½ miles north of the city, is Manistee's chief beauty spot. Among the attractions of this park is a theatre 70 x 102 feet, which seats comfortably about 700 persons.

Suburbs.— Situated on Lake Manistee are Oak Hill, Filer City, Stronach, and Eastlake. The Vacuum Pan Salt Works at Eastlake are the largest in the world, producing 3,500 barrels of salt per day. Pop. (1904) 14,260; including suburbs, 20,000.

Mrs. Edward D. Wheeler.

Manistique, măn-ĭs-tēk', Mich., city, county-seat of Schoolcraft County; on Lake Michigan, at the mouth of the Manistique River, and on the Manistique & N. and the Minneapolis, St. P. and S. Ste. M. R.R.'s; about 70 miles southeast of Marquette. It is in the vicinity of the forests which furnish considerable of the marketable lumber. Iron ore and limestone are abundant in this region. The chief manufacturing establishments are foundries, lime-kilns, lumber mills, chemical works, and distilleries. Charcoal is one of the important products made just outside the city, and fishing is a prominent industry. The opportunities for trade are excellent, and Manistique is a commercial centre for a large portion of the southeastern part of the Upper Peninsula. The city has good public and parish schools and a public library established in 1894. Pop. (1890) 2,940; (1900) 4,126.

Manitoba, Canada, the central province of the Dominion, begins near lon. 95° W., on the international boundary line, and extends to 101½° W.— a distance of 276 miles. It reaches north from the boundary line for 264 miles and being in the shape of an oblong contains area of 73,732 miles. The water surface contained in its inland fresh water lakes is computed at 9,890 square miles. The capital is the city of Winnipeg, lying almost equally distant from the Atlantic and Pacific oceans. The city (1901) contained a population of 42,340, by the Civic Census (1904) 67,000. Other centres are, (1) the city of Brandon (1901) pop. 5,620; (2) the town of Portage La Prairie (1901) pop. 3,901. The province lies at a varying elevation of from 760 to 1,500 feet above the sea.

Topography and Geology (including soils).— The eastern part of Manitoba consists of Laurentian rocks, bare of soil, the region having been the source of supply, when worn down by glacial action, of the deposits to the west. This Archean region stretches for 70 or 80 miles from the eastern boundary, where begins the terrane of the Red River and Assiniboine valleys, varying from 60 to 170 miles in width. The valley region is underlain by limestone deposits of the Silurian and Devonian Period. On the west side of this valley extends at an elevation of from 100 to 150 feet the second prairie steppe, the eastern escarpment of which is the Pembina Mountain, Tiger Hills, Riding Mountain, and Duck Mountain. Underlying this elevated plane the rocks largely of shale and sandstone are of the Cretaceous Period. The rocks of Manitoba contain deposits of iron, gypsum, cement, limestone for building. The Silurian, Devonian and Cretaceous rocks of Manitoba are overtopped by beds of drift or soil from 60 to 200 feet in thickness. This drift having been chiefly deposited in a series of lakes formed by the great melting ice-lobes of the glacial period. In these post-glacial lakes — Agassiz, Souris, and Saskatchewan — the drift beginning at the underlying rock is generally made up of boulders, boulder clay, blue clay, a layer of marly clay called «white mud» and on the surface a rich deposit of humus from two to four feet thick. This upper layer being well supplied with phosphates and nitrogenous components is probably the most fertile soil in North America. Manitoba is well watered by Lakes Winnipeg, Manitoba, Dauphin and Winnipegosis, and by the Red River, Assiniboine and Winnipeg, their affluents. Along the lakes and rivers, and in protected elevations, considerable areas of trees grow. These are chiefly cedar, spruce, tamarack, aspen (poplar), balsam, cottonwood, elm and oak. Indigenous fruits are the strawberry, raspberry, plum, cherry, high bush cranberry, huckleberry and wild grape. The rivers and lakes teem with fish — white fish (largely exported), cat fish, gold eyes, pike, pickerel and sturgeon. The wild animals of the region are (formerly buffalo), moose, jumping deer, antelope, Arctic hare, rabbit, fox, prairie wolf, prairie chicken, partridge, swan, pelican, wild goose, duck, crane, snipe, and a great variety of carnivorous and insectivorous birds. The province is in consequence a famous resort of hunters.

Climate.— The climate in winter is cold, but dry, and though the mercury occasionally falls to 40° below zero, yet it is a pleasant winter climate. Being of a comparatively low level there are few violent storms, and the country is most healthful. The summer months are warm, the days are long, having in midsummer 18 hours of sunshine, the temperature rises at times, but there is almost continuously a slight breeze, and the nights are always cool.

Agriculture and Stockraising.—Wheat, oats, barley, Indian corn, hops and flax grow well. For wheat growing Manitoba presents peculiar advantages, and the principle is here illustrated that the best specimen of a cereal is found along the line of its farthest north development. When compared with the best wheat-growing districts of the United States, the soil of Manitoba is found to produce on an average a greater weight to the bushel. Thirty bushels to the acre is a common crop in Manitoba; while in Southern Minnesota it is 20 bushels, in Pennsylvania and Ohio 15, and in Wisconsin only 14; and while spring wheat (the usual crop) in Manitoba weighs from 63 to 66 pounds to the bushel, that of Minnesota weighs only from 60 to 65 pounds. As to quality also the Manitoba wheat excels; it possesses a large quantity of gluten and sells at ten cents a bushel more than eastern wheat. Potatoes and all other root crops thrive well, while garden vegetables grow with wonderful exuberance. For hay the native prairie grasses in the moist meadows are still largely used, though timothy, which grows freely, is now being considerably cultivated. Cattle.—Shorthorns, Ayrshires, and Galloways are now largely introduced; stockraising is an established industry. Cheese and butter-making in scientifically managed creameries and factories is followed throughout the province. In western Manitoba wheat growing is, however, the favorite occupation.

Commerce, Manufactures and Communications.—The exports include cattle, butter, cheese, and cereals. In 1902, 53,937,000 bushels of wheat were exported. The imports rose in value to $11,802,173. Large works are now (1904) being constructed on the Winnipeg River, fifty miles from the city of Winnipeg, for the production of electricity. These will give cheap power. Manufactories are being largely introduced in Winnipeg and
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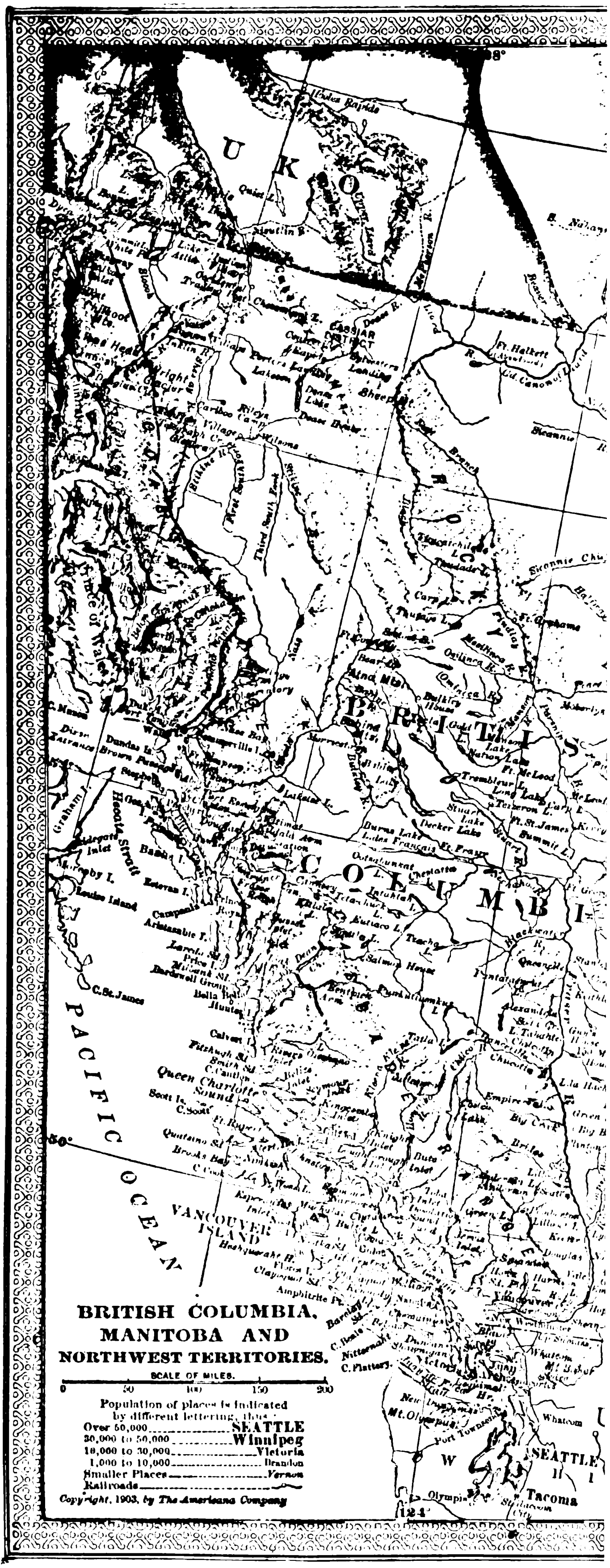

BRITISH COLUMBIA,
MANITOBA AND
NORTHWEST TERRITORIES.

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Over 50,000 .... SEATTLE
30,000 to 50,000 .... Winnipeg
10,000 to 30,000 .... Victoria
1,000 to 10,000 .... Brandon
Smaller Places .... Vernon
Railroads ....

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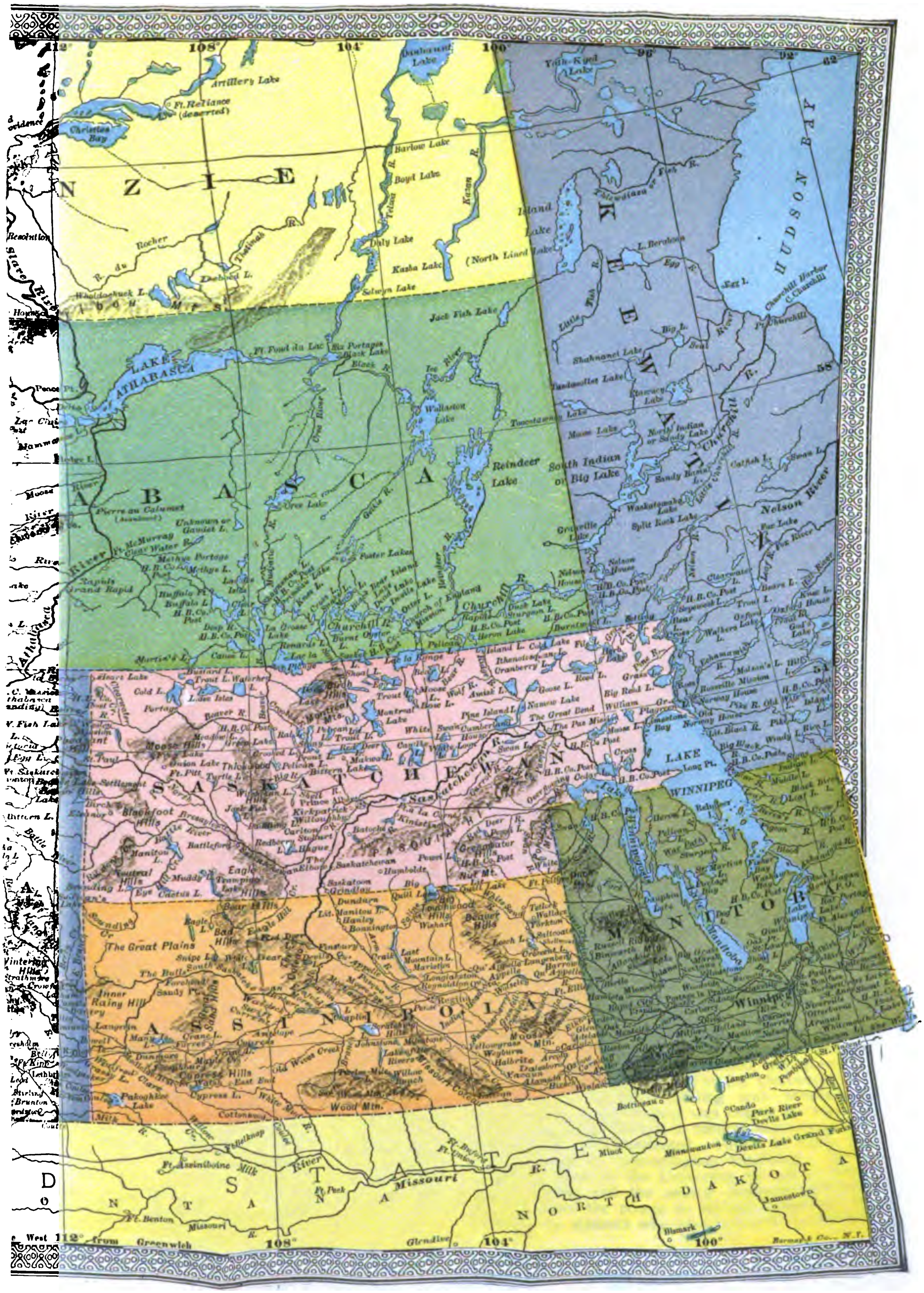
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Lake Manitoba
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Portage la Prairie
Brandon
Regina
Moose Jaw
Saskatoon
Prince Albert
Battleford
Ft. Pitt
Cumberland House
The Pas Mission
Cypress Hills
Wood Mtn.
The Great Plains
Qu'Appelle
Missouri
Milk River
Ft. Benton
Ft. Assiniboine
Ft. Buford
Ft. Union
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Grand Forks
Jamestown
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West 112° from Greenwich
Bormay & Co. N.Y.

having conveyed a grant of land 116,000 square miles to Lord Selkirk, who sent out a number of Scottish colonists, and a small section of Irish emigrants. These settled on the west bank of the Red River, immediately adjoining the present site of Winnipeg. In 1835 the land grant was repurchased from Lord Selkirk's heirs by the Hudson's Bay Company. The British government transferred the country to Canada in 1869, the Canadian government paying $1,500,000 to quiet the claim of the Hudson's Bay Company.

In 1870, under a law of the Canadian Parliament called the Manitoba Act, the province began its constitutional life. The native French settlers, displeased by the transfer of the province, and by some supposed insults offered them by the Dominion government surveyors, formed a provisional government headed by one of their number, Louis Riel. On the arrival of a British and Canadian force under Col. Wolseley, Riel fled to the United States, and opposition to Canadian rule ceased. A second rebellion in 1885, originating in the Saskatchewan district, west of Manitoba, led to Riel's capture and execution. In 1881 the boundaries of the province were greatly widened. In the year of the last census (1901) the population was 255,241, including 5,906 Indians, and 10,371 half breeds.

George Bryce, LL.D.,

Author of 'The Remarkable History of the Hudson Bay Company.'

Manitoba, Canada, a lake situated in Manitoba province, to which it gives its name, about 59 miles southwest of Lake Winnipeg. It is of irregular shape, 119 miles long, with a maximum breadth of 29 miles, a shore-line of 535 miles, an area of 1,171 square miles, and an average depth of 12 feet. It is 810 feet above sea-level, and 40 feet higher than Lake Winnipeg, into which it drains through the Saskatchewan or Dauphin River. The name is a contraction of two Cree words, Manito-waban, meaning «the spirit's strait,» and was originally applied on account of a peculiar agitation of the waters of a strait in the lake. The first European to visit the lake was the Chevalier de la Verendrye in 1739.

Manitoba, University of. The Canadian province of Manitoba, which was formed out of Rupert's Land in 1870, was the outgrowth of the Red River Settlement founded by Lord Selkirk and his immigrants under Hudson's Bay Company auspices in 1812–15. The Scottish settlers were joined from time to time by the Metis, the descendants of French-Canadian voyageurs, who married Indian women, and also by the children of company officers and Orkney employes of the Hudson's Bay Company who had taken Indian wives. This mixed community in 1870 numbered 12,000 souls.

To the Metis came from Lower Canada Priest (afterward Bishop) Provencher, who in 1818 established a school, which grew in later times into Saint Boniface Roman Catholic College. The English-speaking half-breeds belonging to the Church of England were educated at Saint John's College, which was reorganized in 1866 by Bishop (afterward Archbishop) Machray. Just as the new province of Manitoba was forming there was established in 1871, by the writer, in Kildonan, near Winnipeg, among the Selkirk Scottish settlers, a Presbyterian college, known since as Manitoba College. This last-named college was in 1874 removed to Winnipeg. These three denominational colleges were all in or near the new city lege. This last-named college was in 1874 In 1875 an important meeting was held in the court-house, Winnipeg, by Manitoba College, in which a union of the three colleges under a provincial university was suggested. Governor Morris favored this plan, and in 1877 an act was passed in the legislature of Manitoba establishing the University of Manitoba, to which the three colleges, Saint Boniface, Saint John's, and Manitoba were affiliated. The University was at first to be only an examining body, the teaching being done entirely by the colleges.

The new University was unique. It brought together the largest religious bodies of the province, and kept up the standard of education, it being the only source of degrees. Its first examinations took place in May 1878, when seven candidates presented themselves. In 1878 application was made to the Dominion government for a land grant, and at length, in 1885, under the «Better Terms Settlement» of that year, 150,000 acres of good agricultural wild land was given to the University. This endowment is now valued at $1,250,000. In 1883 a native of Red River Settlemen living in England, Mr. A. K. Isbister, who like many others, was attracted by the broad and cosmopolitan spirit of the young university, bequeathed $83,000 as a scholarship fund to the University. This fund has proved a great boon to the students, as from it upward of $3,000 is given annually in scholarships.

In 1882 the Manitoba Medical College was founded and became affiliated to the University. In 1888 a new member of the sisterhood of Arts Colleges — Wesley College of the Methodist Church — was affiliated to the University; a College of Pharmacy was affiliated in 1902. A Baptist college in Brandon, the second city of the Province, though not affiliated, yet sends its students up to the University examinations.

The affiliated colleges have a representation of seven members each on the University council; the graduates of the University, now numbering upward of 400, have ten representatives, and the Provincial Government appoints seven. The University council thus consists of about 50 members. It has a chancellor appointed by the Provincial Government, and a vice-chancellor chosen by the council. The lieutenant-governor of Manitoba is Visitor. The executive of the council is a representative body of 13 members, and is called the «Board of Studies.»

In 1893 the university act was changed to allow teaching to be done by the University in natural science, mathematics, and modern languages, the arts colleges taking up the other departments. In 1898 a site of seven acres in the heart of Winnipeg, valued at $120,000, was given by the Dominion Government to the University, and in 1900 the first building was erected. Teaching in natural science was begun in 1900, and in 1904 six professors in natural science and mathematics were appointed. There is also a large amount of intercollegiate teaching. Degrees are given by the University in arts, law, and medicine, and the several denominational colleges have the power to bestow degrees in theology on students who have passed a certain arts requirement in the University. These degrees on being reported become *ipso facto* degrees of the University.

Thus the two systems of university education — national and denominational — are combined, and the advantages of both obtained. The denominational colleges have their residences and grounds; and exercise discipline and social control over their students, while the provincial university conducts the examinations, confers degrees, and has taken over science teaching, the most expensive department of education. It may take other subjects in the future.

The University is supported by the revenue from the lands, a Provincial Government grant, fees of students and candidates, and by private benefactions — Lord Strathcona giving it for immediate purposes $20,000. In 1904 the University examined 812 candidates.

The arts curriculum is a blending of a fixed course, with certain options in the first and second years, and then specializing is allowed in the third and fourth years in one of the departments of classics, mathematics, modern languages, philosophy, natural science, or a general course.

The University building accommodates the department of science, which is generally being well equipped for its work. A library has been begun, but is still in its infancy. The several affiliated colleges have large libraries, and the students have access to the Provincial Library and the new Carnegie Library of the city.

As the University of Manitoba is the only university in Canada west of Lake Superior, it cultivates the whole region of Manitoba, new Ontario, the Northwest Territories, and British Columbia. It holds local examinations at several points in Manitoba, as well as Regina, Calgary, and Edmonton in the Territories, and at Vancouver, Kamloops, and Victoria in British Columbia. On account of the vast territory served, and of its having no rival in western Canada, Manitoba University, should no change take place in its prospects, bids fair to be in 25 years the largest university in Canada.

George Bryce, D.D., LL.D.,
Member of Board of Studies University of Manitoba.

Manitou, măn'ĭ-too, a name given, among the American Indian tribes, to any spirit, good or evil; also applied to any object of religious awe and reverence. «The Illinois,» wrote the Jesuit Marest, «adore a sort of genius, which they call manitou; to them it is the master of life, the spirit that rules all things. A bird, a buffalo, a bear, a feather, a skin — that is their manitou.» «If the Indian word manitou,» says Palfrey, «appeared to denote something above or beside the common aspects and agencies of nature, it might be natural, but it would be rash and misleading to confound its import with the Christian, Mohammedan, Jewish, Egyptian, or Greek conception of Deity, or with any compound of a selection from some or all of those ideas.» The word was applied to any object used as a fetish or an amulet. It was common among all western and Mississippi tribes.

Manitou, Colo., town, in El Paso County; on the Denver & R. G. and the Colorado M. R.R.'s; about seven miles northwest of Colorado Springs. It is situated in a region renowned for

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city has national, savings, and other banks, waterworks, gas and electric light; and daily and weekly newspapers, several of which are published in the German language. Manitowoc is the seat of the county asylum, St. Mary's Hospital, St. Felix Industrial and Reform School, Holy Family Hospital, and the James Library, and has a courthouse, a high school, public and parochial schools, and several handsome churches. Pop. (1890) 7,710; (1900) 11,786.

Manizales, mă-nē-sä'lās, Colombia, town, in the southern part of the department of Antioquia; about 95 miles northwest of Bogota. The altitude is about 7,000 feet. It was founded in 1848 and its situation at the junction of the main passes over the mountains, and near valuable gold mines has contributed to its rapid growth. In the valleys, in the vicinity, stock-raising is an important industry. It has fine churches and schools, a good library and a number of comfortable homes. During the civil war of 1877–8 the town was the headquarters of the rebels. The climate is not severe, although in a high altitude, as higher mountains in the vicinity are a protection. Pop. about 20,000.

Mankato, măn-kä'tō, Minn., city, county-seat of Blue Earth County; on the Minnesota River at the mouth of the Blue Earth River, and on the Chicago, M. & St. P., the Chicago G. W., the Chicago & N. W., and the Chicago, St. P., M. &. O. R.R.'s; about 88 miles southwest of Saint Paul. It is situated in an agricultural and timber region, and in the vicinity are valuable stone quarries. Its chief manufactures are knit goods, lime, cement, beer, butter, candy, flour, lumber, foundry and machine-shop products. There are in manufacturing business about 3,000 employees. The principal buildings are State Normal School, a government building, a Carnegie public library, Saint Joseph's and Tourteilotte hospitals. The city has 20 churches, good public and parish schools, a commercial college, and the State school, which has been mentioned. There are four banks with a combined capital of $350,000. The business amounts to about $4,000,000 annually.

The city was first settled in 1852 by eastern people. It was incorporated 15 July 1858, and chartered as a city 6 March 1868. The present government, according to a charter of 1891, is vested in a mayor and in a council composed of six members. Mankato was the scene of several battles during the Sioux Indian War 1862–3. In 1863, 38 Indians were hung for murder. Pop. (1890) 8,838; (1900) 10,599; (1903) 12,000.

J. E. REYNOLDS,
Editor 'Daily Free Press.'

Manley, măn'lĭ, **John**, American naval commander: b. 1734; d. Boston 1793. At the outbreak of the Revolutionary War he had command of the armed schooner Lee, with which he cruised along the coast of Massachusetts Bay, making captures of great value to the American army then investing Boston. In July 1778, his ship, the Hancock, was captured by a British frigate and after a rigorous confinement in Halifax, he was exchanged, and in 1782 was put in command of the Hague frigate, which, after lying in a perilous position on a sand bank off Guadeloupe for three days, exposed to the fire of four British ships of the line, contrived to effect her escape. This exploit closed the regular maritime operations of the United States during the Revolutionary War.

Manley, Joseph Homan, American journalist and politician: b. Bangor, Maine, 13 Oct. 1842; d. Augusta, Maine, 7 Feb. 1905. He graduated from the Little Blue Abbott Academy at Farmington, Maine, in 1858 and in 1862, at the age of 21, from the Albany Law School. He was admitted to the bar in 1865, being appointed a commissioner of the United States district court, serving one year. In 1866 he was president of the city council of Augusta and in 1881 was appointed postmaster of Augusta by President Garfield, which office he held for seven years. Acquiring a half interest in the 'Maine Farmer' he joined hands with James G. Blaine in aggressive local and national politics, dictating the editorial policy of that paper for three years. He was a delegate to the Republican National conventions of 1880 and 1888, was for many years chairman of the Maine Republican State committee and a member of the Republican National committee and was a notable figure in the executive committees of 1896 and 1900, which aided in the election of McKinley.

Manley, Mary de La Rivière, English author: b. in the island of Guernsey about 1672; d. London 11 July 1724. She succeeded Swift as editor of the 'Examiner' in 1711. She is known for her 'Secret Memoirs and Manners of Several Persons of Quality of Both Sexes: from the New Atlantis' (1709), a licentious satire that caused the arrest of both the author and the publisher, though they were subsequently discharged. This work was continued in the 'Memoirs of Europe' (1710). She also published 'Letters Written by Mrs. Manley' (1696); 'The Secret History of Queen Zarah and the Zarazians' (1705); 'The Adventures of Revella' (1714); 'The Power of Love: in Seven Novels' (1720); and other unimportant books.

Manley, Thomas Henry, American physician and author: b. Tewksbury, Mass., 1 March 1851. He was graduated at the medical department of the University of New York in 1875; and practised his profession in Lawrence, Mass., until 1881, when he removed to New York. He has been a visiting surgeon to many of the hospitals in the latter city; is professor of surgery in the New York School of Clinical Medicine; and has published 'Operations for Hernia' (1890); and 'Local Anæsthetics' (1893).

Manlius, măn'lĭ-ŭs, **Marcus**, Roman legendary hero, of the 4th century B.C., called Capitolinus because of his successful defense of the Capitoline Hill. Tradition says he was aroused to action by the cackling of Juno's sacred geese just in time to prevent the surprise of the citadel by the Gauls (390 B.C.). Two years before (392 B.C.), he defeated the Æqui; and in six years after (384 B.C.) was thrown from the Tarpeian rock, having been declared guilty of plotting to become king or dictator. This judgment, almost certainly unjust, was due to the envy of the patricians, who distrusted Manlius' philanthropic endeavors to free plebeians sold for debt.

Manly, Basil, American clergyman and educator: b. Pittsborough, Chatham County,

N. C., 28 Jan. 1798; d. Charleston, S. C., 25 Jan. 1865. He was graduated at South Carolina College in 1821, and, after filling several charges, in 1837 he became president of the University of Alabama, remaining there nearly 20 years. He was instrumental in founding the Southern Baptist Theological Seminary at Greenville, S. C., in 1858.

Manly, John Matthews, American educator: b. Sumter County, Ala., 2 Sept. 1865. He was graduated at Harvard in 1889. Professor of English in Brown University 1891–8; and in the University of Chicago after 1898. He has contributed to several periodicals and has edited ‘Macbeth’ (1896); and ‘Specimens of the Pre-Shakesperean Drama’ (1897).

Manly, Louise, American teacher and author: b. Richmond, Va., 10 July 1857. She was graduated at Georgetown, (Ky.) Seminary in 1885, and afterward studied music and languages in Europe. She has published ‘Southern Literature’ (1895); ‘History of Alabama for Children,’ and ‘History of the Judson Institute’; and was co-editor of ‘English Poets’ (1903).

Mann, Cameron, American Protestant Episcopal bishop: b. New York city 1851. He was graduated from Hobart College in 1870 and studied at the General Theological Seminary. His ordination to the ministry occurred in 1876 and he was rector at St. James', Watkins, N. Y., until 1882, when he went to Kansas City, where he was rector of Grace Church 1882–1901. He was consecrated bishop of North Dakota in 1901. He has contributed poems and articles on botanical and theological subjects to different magazines and also has published: ‘October Sermons’ (1888); ‘Comments at the Cross’ (1893); etc.

Mann, Henry, American journalist: b. Glasgow, Scotland, 25 March 1848. He was educated in Scotland and England, but at 15 came to the United States where he served in the Federal army in 1864–5 and later in the wars with the Indians in the Northwest. He has been on the editorial staff of the leading New York and Providence newspapers and was special correspondent in the war with Spain. In 1895–6 he was editor of the ‘Home and Country Magazine’ and in 1898–9 assistant editor of ‘Success.’ He has published: ‘Ancient and Mediæval Republics’ (1879); ‘Features of Society in Old and New England’ (1885); ‘Turning Points in History’ (1895); ‘The Land We Live In’ (1896); ‘Adam Clarke’ (1904).

Mann, Horace, American educationist: b. Franklin, Mass., 4 May 1796; d. Yellow Springs, Ohio, 2 Aug. 1859. He was graduated from Brown University in 1819, studied law at the Litchfield (Conn.) law school and in offices at Dedham, Mass., in 1823 was admittted to the bar, and practised at Dedham from 1827 to 1833, when he removed to Boston. In 1827–33 he was a representative in the State legislature, in 1833–7 State senator, and in 1836–7 president of the senate. From the first he identified himself with philanthropic interests. His first speech in the assembly was on religious liberty; and one of his enterprises was the establishment of the State lunatic hospital at Worcester (1833), in connection with which he was chairman of the

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gative, and is principally administered to children. The finest kind of manna is called *flake manna;* it is white or yellowish-white in color, light, porous, and friable. *Sicilian manna* is generally found in small, soft, round fragments; its color is yellowish-brown, and it is generally mixed with more or less impurities. The principal constituent is mannite, chemically separable as a white crystalline substance of a sweetish taste, which also appears as a whitish efflorescence on certain edible seaweeds and fungi. To this, and the saccharine elements, the nutritiousness of manna is due.

Many other sweet tree-juices go by the name of manna, or false manna, since they contain no mannite, but depend for their peculiar qualities upon the possession of melitose or meletzitose. In many cases the exudation of the sap is due to the irritation produced by insects or is the product of the insects themselves. Thus edible exudations are obtained from the oriental tea-tree, sandal-wood and an Australian grass (*Andropogon*); in Europe from the larch and an oak, and in Persia from the camel's-thorn. American manna is derived in California from the sugar pine and from a rush (*Phragmites*); while in India a species of bamboo secretes it so copiously as to form an important food-resource for the people in periods of famine.

The tamarisk manna, derived from the tamarisk trees about the eastern end of the Mediterranean, is not a direct product of the tree, but of a scale-insect, the manna-insect (*Jossyfraria mannifera*), which abounds upon the tamarisk and secretes the substance, which some persons have regarded as the manna of the Bible. In Australia the waxen larval cases of several species of flea-lice (*Psyllidæ*) that feed upon the gum-trees (*Eucalyptus*) are gathered and eaten by the natives under the name of «lerp.»

The Scriptural manna (Heb. Man-hu, what is it?) is described in Exodus (xvi. 15) as covering the ground in such quantities as to supply food for the vast multitude of the Israelites. It was small and round like coriander seed, white and tasting like honey and wafer. It cannot be identified with any of the substances known nowadays as manna; but is called in the Bible «bread from heaven,» while the Jewish doctors taught that it became to each person who ate it that meat of whatever kind he liked best.

Mannaia. See Guillotine.

Mannheim, măn'hīm, Germany, a town of Baden on the Rhine, at the confluence of the Neckar, 66 miles by rail southwest of Frankfort. Dikes protect it from inundation and there are extensive harbors and modern docks. A bridge across the Rhine, here 1,200 feet wide, connects with Ludwigshafen, Bavaria, and there is also a bridge across the Neckar. Mannheim is the first commercial town in the grand-duchy and on the upper Rhine. This it owes to its admirable position on two important navigable rivers, and its railway communications. The principal articles of trade are corn, flour, wood, petroleum, coal, tobacco, cattle, sugar, iron goods, etc. The manufactures consist chiefly of iron-castings, machinery, chemicals, cigars, carpets, woolen goods, celluloid and rubber wares, mirrors, carriages, trinkets, sugar, liqueurs, starch, glue, etc. Mannheim was once strongly fortified and lying not far from the French frontier, and near the centre of military operations, suffered severely during the wars between France and Germany. In a siege by the Austrians in 1795 only 14 houses remained uninjured. Hence, notwithstanding the antiquity of its foundation, it has become an entirely modern town with regular, straight streets, known, as in America, by numbers, and with fine public squares. The principal buildings are the former Palatine palace, with a museum and picture-gallery in one of its wings, a public library, and good gardens behind it; the Jesuits' church, an imposing edifice, with a profusely decorated interior; the former observatory building; the theatre, one of the best in Germany; several gymnasia and schools; conservatory of music; hospitals and orphanage; town-house; railway-station, etc. Pop. (1895) 97,980; in 1899 the suburb of Neckarau was incorporated with it; pop. (1900) 140,384.

Manning, măn'ĭng, **Daniel,** American journalist and financier: b. Albany, N. Y., 16 May 1831; d. there 24 Dec. 1887. At 10 he entered the printing-office of the Albany 'Atlas' which shortly after was merged in the 'Argus' upon which paper he became a reporter and in time an authority in State politics. He was associate editor in 1865 and later was part owner of the paper which in his hands was a strong political power and instrumental in breaking up the Tweed ring. He strongly supported Gov. Tilden's administration and through his membership of the New York State committee he was intimately connected with the leaders of his party. Upon Cleveland's inauguration in 1885 Manning was appointed secretary of the treasury, the affairs of which office he conducted with great ability. He resigned in 1887 as a result of ill health, though he was connected with several commercial and banking enterprises until his death in the same year.

Manning, Henry Edward, cardinal of the Roman Catholic Church and archbishop of Westminster: b. Totteridge, Hertfordshire, 15 July 1807; d. Westminster 14 Jan. 1892. He was educated at Harrow, and Balliol College, Oxford, became a fellow of Merton College in 1832, and in that year he was ordained and appointed curate of Woollavington-cum-Graffham in Sussex. In 1833 he became rector of Woollavington, and was appointed archdeacon of Chichester in 1840. In 1842 he was select preacher to the University of Oxford. He took very little part in the tractarian movement and did not write any of the tracts, but he formed friendships with some of the leaders of the movement. In 1851, after the decision in the «Gorham case,» he joined the Roman Catholic Church and was ordained priest. He founded the Congregation of the Oblates of St. Charles at Bayswater, London, in 1857, and upon the death of Cardinal Wiseman was consecrated archbishop of Westminster in 1865. At the Œcumenical Council in 1870 he was an ardent supporter of the infallibility doctrine, and in 1875 was made a cardinal by Pius IX. Manning was a trusted leader of the Ultramontane party in his church, and he commended himself to the world in general by his zeal on behalf of temperance, education, and the betterment of the working-classes. He is the author of four volumes of sermons published before 1850; and among his other writings are: ‹Temporal Power of the Popes› (1860); ‹The Temporal Mission of the Holy Ghost› (1865 and 1875); ‹Petri Privilegium› (1871); ‹The Vatican Decrees› (1875); ‹The Catholic Church and Modern Society› (1880); ‹The Eternal Priesthood› (1883); ‹Characteristics› (1885); ‹Miscellanies› (1877–88); ‹Religio Viatoris› (1889). Consult Lives by Hutton (1894); Purcell (1896); De Pressense (1903); Fitzgerald, ‹Fifty Years of Catholic Life and Progress› (1901). See His Memorials (1892).

Manning, James, American Baptist clergyman, first president of Brown University: b. Elizabeth, N. J., 22 Oct. 1738; d. Providence, R. I., 29 July 1791. He was graduated at Princeton College in 1762, in 1763 became pastor of a Baptist church at Morristown, N. J., and about a year later pastor of a church in Warren, R. I. There he almost immediately commenced a Latin school, which seems to have been in some sense the germ of Rhode Island College. He had previously proposed to several influential men in his denomination, assembled at Newport, the organization of «a seminary of polite literature, subject to the government of the Baptists,» and had drawn up a plan for such an institution. In 1764 the legislature granted them a charter, and in 1765 he was appointed «president and professor of languages and other branches of learning, with full power to act in these capacities, at Warren or elsewhere.» The college went into operation at Warren in 1766, and the first commencement was held there in 1769, when a class of seven was graduated. In 1770 it was determined to remove the college to Providence, and during the Revolution, when the college edifice was occupied as a military barrack, and afterward as a hospital, he was actively engaged in clerical duties, and also rendered important services to the patriotic cause. In 1783 he resumed his duties at the college, and in 1786 represented Rhode Island in Congress, where he exerted himself to secure the adoption of the national Constitution. From 1770 till the year of his death he was also pastor of the first Baptist Church in Providence. He resigned the presidency of the college in 1790. Consult: Guild, ‹Life and Times of James Manning and the Early History of Brown University› (1894). See Brown University.

Manning, Thomas Courtland, American jurist: b. Edenton, N. C., 1831; d. New York city 11 Oct. 1887. He was graduated from the University of North Carolina, admitted to the bar and for a time practised law in his native place, but in 1855 he went to Alexandria, La., and there established himself in a large practice. He was a delegate to the Secession Convention and at the outbreak of the war entered the Confederate army as lieutenant. He served as adjutant-general in 1863 and attained the rank of brigadier-general. In 1864 he was associate judge of the supreme court of Louisiana. He was a presidential elector in 1872 and 1876 and in 1877 he was chief justice of the State supreme court. He was denied admission to the Senate upon his appointment to that body in 1880, and in 1882–6 he again filled the office of justice of the supreme court. He was appointed minister to Mexico in 1886 and died in office.

Manning, S. C., town, county-seat of Clarendon County, on the Atlantic Coast Line

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pressure of the fluid under examination and that of the atmosphere is found by observing the difference between the levels of the manometric fluid in the two branches of the U-tube. If the absolute pressure of the fluid is desired, it is necessary to add the atmospheric pressure to the differential pressure as read from the manometer. In rough work it may be sufficient to assume the atmospheric pressure to be 14.7 pounds per square inch; but in more refined observations the atmospheric pressure must be determined by reading the barometer, simultaneously with the manometer. Mercury is commonly the liquid that is used in the U-tube, but when the differences in pressure that are to be read are very small, some less dense liquid may be used with advantage. Sulphuric acid is often employed in such cases; and where (as in the measurement of chimney draft) a slight amount of evaporation from the manometric fluid is unimportant, water may be employed. When the pressure to be measured materially exceeds one atmosphere, the siphon manometer, as just described, is modified by sealing one of the ends of the U-tube, instead of leaving it open to the air. In this case the pressure is determined by observing the amount of compression that it produces in the air that is confined in the sealed arm of the siphon, by the manometric fluid; for it is known, by Boyle's law, that the volume of the air in this arm is sensibly proportional to the reciprocal of the absolute pressure, so long as the temperature remains constant. (See Gases, General Properties of.) Boyle's law is not rigorously exact, however, and when a high degree of precision is required from the compression manometer, it is necessary to make allowances for its error. Data for this purpose have been given by Amagat, up to 85 atmospheres, when the temperature of the manometer is maintained at 16° C. (60.8° F.) (See Amagat, 'Comptes Rendus,' Vol. XCIX., p. 1153; Preston, 'Theory of Heat,' p. 403.) In steam engineering the commonest form of manometer is the «Bourdon gauge,» which depends for its action upon the elastic deformation of a flattened metallic tube when exposed to an internal pressure. In practice the flattened tube is bent into a circular form, one end of it being fixed while the other communicates, by means of a multiplying gear, with an index hand which travels over the face of a graduated dial. A tube so constructed straightens out slightly when subjected to an internal pressure, returning again to its original form when the pressure is removed. The deformation is approximately proportional to the magnitude of the pressure (so long as the tube is not strained beyond its elastic limit), and hence the dial may be graduated, without difficulty, so as to indicate true pressures, at least to a degree of precision quite sufficient for the purposes of steam engineering. All such gauges should be carefully compared with a standard mercury column, however, before great reliance is placed upon them; for it is found that they are sometimes seriously in error in some parts of the scale, even when sensibly correct in other parts. In using them in connection with steam boilers, care should also be taken to prevent steam or highly heated water from coming in direct contact with the curved tube, since the elastic properties of the tube are injured by overheating. To ensure the proper protection of the gauge, a siphon, or a complete circular bend, should be placed in the pipe between the gauge and the boiler. The trap so formed will fill with water of condensation the first time the boiler is fired up, and thereafter it will be impossible for steam to enter the gauge directly.

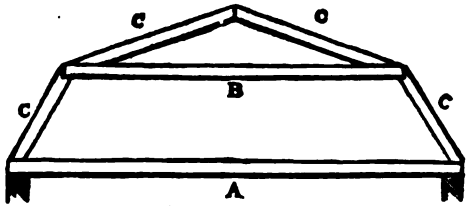
Manon Lescaut, mä-nôṅ lĕs-kō, a romance by the Abbé Prévost, published in Amsterdam in 1733, when its author was in exile. It is appended to 'Memoirs of a Man of Quality' as a kind of postscript, and is ranked by critics as the first example in French literature of what may properly be considered a novel.

Man'or (old French *manoir, maneir,* from L. *manere,* to remain, being the residence of the owner) a piece of territory held by a lord or great personage, who occupied a part of it, as much as was necessary for the use of his own household, and granted or leased the remainder to tenants for stipulated rents or services. No manors, with all their incidents and franchises, have been granted in England since the reign of Edward III. One of the most important incidents to these ancient manors was the right to hold a court, called a *court-baron,* which was held within the manor, and had jurisdiction of misdemeanors and nuisances within the manor, and disputes about property between the tenants. The manor system was in vogue in the United States only during the British occupation; but many old manor names like Briarcliffe manor, Pelham manor, etc., are still retained by the present owners of large estates. See also Tenure.

Mans, mäṅ, **Le**, France, the capital of the department of Sarthe, on a height above the Sarthe, here crossed by three bridges, 115 miles southwest of Paris. It consists of a lower and an upper town. The principal edifice is a fine Gothic cathedral of the 10th century. The chief manufactures are metal-works, tobacco, and woolen and linen goods; and the trade in these and other goods is considerable. Le Mans existed in the time of the Romans under the name of Cenomani, a tribe who inhabited the district. Numerous vestiges of Roman structures (subterranean aqueducts, walls, etc.), still remain. It was long in the possession of the English, and Henry II., the first Plantagenet, was born here. During the Franco-German war (1870–1) Gen. Chanzy was defeated here by Prince Frederick Charles and the Grand-duke of Mecklenburg. Pop. (1901) 52,902.

Mansard, mäṅ-sär, or **Mansart, François**, fräṅ-swä, French architect: b. Paris 23 Jan. 1598; d. there 23 Sept. 1666. He designed many important buildings in Paris, as well as provincial chateaux and country seats. The chateaux at Bolois are partly his work, and he built the Church of Val de Grâce and the Hotel Carnavalet. The mansard roof is called after him.

Man'sard Roof, in architecture (so called from François Mansard, or Mansart (q.v.), a French architect to whom the invention is attributed), a roof formed of two sets of rafters, of which the upper set are more inclined to the horizon than the lower set, and form an obtuse angle at the ridge. The transverse beams connecting the lower ends of the under set of rafters are called as in ordinary roofs tie-beams; the corresponding beams at the union of the upper and under rafters are called collar-beams.



Mansard Roof.

Mansart, Jules Hardouin, zhül är-doo-äṅ mäṅ-sär, French architect: b. Paris 16 April 1645; d. Versailles 11 May 1708. He was a nephew of François Mansart, or Mansard (q.v.). He directed all the great building operations of Louis XIV., who heaped favor and wealth upon him. His works include the palace at Versailles; the Maison de Saint-Cyr; the Grand Trianon; the dome of the Invalides; and the Chateau de Clagny, the residence of Madame de Montespan. He also designed the Place Vendôme, and the Place des Victoires.

Manse, in Scotch law, a name given the dwelling house of the minister of the Established Church. In popular use the term is often applied generally to the dwelling house of any minister of a dissenting congregation. In the Established Church every first minister of a rural parish is entitled to a manse, which the heritors or landed proprietors in the parish are bound to build and uphold. When a manse has been built or repaired by the heritors it becomes a free manse, and all ordinary repairs have to be done at the charges of the minister.

Man'sel, Henry Longueville, English logician and theologian: b. Cosgrove, Northamptonshire, 6 Oct. 1820; d. London 30 July 1871. He was educated at St. John's College, Oxford, and took orders in the Anglican Church in 1845. He became Wayneflete professor of philosophy at Oxford in 1859; Regius professor of ecclesiastical history 1867; and Dean of St. Paul's, London, 1868. He was made a canon of Christ Church, Oxford, in 1867. Among his publications are: 'The Philosophy of Kant' (1856); 'The Limits of Religious Thought,' being the Bampton lectures for 1858; 'Metaphysics, or the Philosophy of Consciousness' (1860); 'The Philosophy of the Conditioned' (1866); 'Letters, Lectures, and Reviews' (1873).

Mansfeld, mäns'fĕlt, **Peter Ernst I.**, Count, Austrian general and statesman: b. 15 July 1517; d. Luxemburg 22 May 1604. He became governor of the Low Countries after the death of the Duke of Parma.

Mansfeld, Peter Ernst II., Count, German Protestant military leader: b. Luxemburg, 1580; d. Racowitza, Bosnia, 29 Nov. 1626. He was a natural son of the preceding, but, disappointed in regard to the inheritance of his father's lands, joined the Protestant princes and became the bitter enemy of Austria. He gained a victory over Tilly at Wiesloch in 1622 but was defeated by Wallenstein at Dessau in 1626, and died soon after.

Mansfield, mănz'fēld, **Edward Deering**, American author: b. New Haven, Conn., 17 Aug. 1801; d. Morrow, Ohio, 27 Oct. 1880. He

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Chapelle, and was admitted leader of the House. An attempt to prove him guilty of treason or disloyalty to the Crown was unsuccessful, though often obliquely repeated. He was made attorney-general in 1754, and chief justice and Baron Mansfield in 1756. He was a member of the cabinet, without office, for 15 years, but his part in politics waned after he went on the bench. He was still a typical Tory, however, and in 1770 sided violently with the government in the political libel trials and was sharply attacked by Junius. His unpopularity steadily increased because of his opposition to Wilkes, whose sentence, however, he greatly lightened because of a technical flaw which he discovered himself, and in general because of his contention in various famous cases of libel that the jury could decide only on the facts and not on any question of law. In 1774 in the case, Campbell *v.* Hall, he decided that countries acquired by British conquest were governed by the general principles of the British constitution; but in regard to the American colonies he insisted that their complaints could not be considered until they had submitted themselves to Parliament. He became Earl of Mansfield in 1776; proposed the coalition of 1779; and in 1780 suffered at the hands of the Gordon rioters because of his sympathy with Catholic emancipation. In 1788 he retired from the bench. Though so unpopular, and though constitutionally a believer in royal prerogative, Mansfield was a great judge, whose work was not too conservative, and an able, calm, logical debater. Possibly his greatest labor was his revision of the mercantile law.

Mansfield, England, a town in Nottinghamshire, 14 miles north by west of Nottingham, in a deep valley, surrounded by vestiges of Sherwood Forest. There are cotton-mills, manufactures of silk and cotton hosiery, lace thread-mills, etc. Pop. (1901) 21,441.

Mansfield, Ohio, city, county-seat of Richland County; on the Pennsylvania, the Baltimore & O., and the Erie R.R.'s; about 62 miles southwest of Cleveland and the same distance northeast of Columbus. Mansfield was first settled in 1807 by Jacob Newman, and became a borough in 1828 and a city in 1857. It is situated in a fertile agricultural region, and its manufactures and commerce are connected with the farm products of the county. The chief manufactures are boilers, agricultural machinery, pumps, soil pipe, steel harrows, brass goods, electrical supplies, stoves, webbings, suspenders, and wagons. The number of persons employed in the manufactories is about 3,500. The trade is principally in the manufactures of the city, farm and dairy products. The chief buildings are the Ohio State Reformatory, the Public Library, the Children's Home, and the Y. M. C. A. building. The city has 25 church buildings, nine large school buildings and several primary school and kindergarten buildings, one parish school, and two business colleges. Mansfield was the home of John Sherman. There are four banks with a combined capital of $725,000. The government is vested in a mayor, boards of public service and safety and a council of seven members. Four members of the council are elected from the wards and three at large. The city owns and operates the waterworks, also a large sewage and garbage disposal plant. Pop. (1890) 13,473; (1900) 17,640.

E. S. Hiestand,
Editor of Mansfield 'Daily News.'

Mansfield, Pa., borough, in Tioga County; on the Tioga River, and on the Erie railroad; about 108 miles north by west of Harrisburg and 25 miles southwest of Elmira, N. Y. It is in the midst of an agricultural region and near the coal fields and oil region. Its chief manufactures are lumber, glass, sheet-iron, agricultural and mining machinery. It is the seat of a State normal school, and has two libraries, one of about 6,000 volumes belonging to the Normal School, and a city library containing about 2,000 volumes. Pop. (1900) 1,847.

Mansfield College, Oxford, England, a theological institution established in 1889 for the education of men for the Nonconformist ministry. It owes its inception chiefly to Congregational support. Its students must be graduates of some recognized university, or undergraduates of Oxford who have passed Moderations. The staff consists of a principal, a vice-principal, three lecturers, and a bursar. Mansfield House, at Canning Town (West Ham), is a settlement in connection with the college.

Mansfield, Mount, in Vermont, one of the highest elevations of the Green Mountains; in the northwestern part of the State, about 23 miles east of Burlington. The view from its summit includes the Adirondack and White Mountains, Lake Champlain, a large portion of the northern part of Vermont, and some of New Hampshire. See Green Mountains.

Mansilla de García, Eduarda, ā-doo-är'dä män-sēl'yä dā gär-sē'ä, Argentine novelist: b. Buenos Ayres 1838. Her maiden name was Mansilla; at 16 she married Manuel R. García, a diplomat; and at 19 published 'El Médico de San Luis,' possibly her best novel. It was followed by 'Lucia Miranda,' a historical novel on the discovery of La Plata, and by 'Pablo, ó la Vida en las Pampas,' which with its fresh description of Argentine life made a great impression in Paris and was praised by Hugo. She was a musician of much talent and wrote, besides novels, several plays.

Mansion House, in London, England, the official residence of the Lord Mayor, built on the site of the Old Stock Market in 1739, at a cost of $213,190. It is an oblong building and contains an Egyptian banquet hall accommodating 400 guests.

Man'slaughter, the 2d degree of felonious homicide. Murder and manslaughter are distinguished from each other by the intent which causes or accompanies the act. If a homicide be not justifiable nor excusable, and yet be not committed with malice aforethought, it is manslaughter. It is quite certain that the intent need not be to kill; for while there must be a criminal intent to make a person amenable to law as a criminal, yet if one crime be intended, and in the act of committing it another of a higher character be also committed without intent, the criminal is responsible for this higher crime. The general principle laid down in respect to manslaughter is, that not only a positive intention to commit some crime, but mere negligence, may make one guilty. If any one take upon himself an office or duty requiring care or skill, he is liable for the want of either; and if death be the consequence of his ignorance or carelessness, he is guilty of manslaughter. So if one driving furiously run over and kill a person whom he did not see, or if one in command of a steamer or sailing-vessel by reason of gross negligence run down a boat and some one in it be drowned, this would be manslaughter. So if any one, whether medical by profession or not, deal with another as a physician, and through gross want of care or skill kill him; or if any one charged with building a house of any kind construct it so badly that it falls and kills persons within or near it; or if in building he drop a stone upon some one passing below, and kill him; in all these cases he would be guilty of manslaughter, provided he were grossly negligent in the act causing the death. This is the essential question.

Blackstone defines manslaughter thus:

> **Manslaughter is therefore thus defined, the unlawful killing of another without malice either express or implied; which may be either voluntarily, upon a sudden heat, or involuntarily, but in the commission of some unlawful act.**

The judicial treatment of this crime, being regulated by statute, varies in the several States. The element of premeditation is not essential to conviction of this crime. There are cases which the law regards as only manslaughter, without evidence of momentary excitement; partly because the law infers that from such a provocation there must be excitement; and partly, perhaps, because the party killed brought his death upon himself by his outrageous wrong. Thus, if a husband detects his wife in adultery, and instantly and purposely takes either her life or the adulterer's, it is only manslaughter. Not so, however, if he waits for a subsequent opportunity, for then the first reason wholly fails, and the killing becomes murder.

In New York State four degrees of manslaughter are defined. The first degree, briefly stated, consists of killing without the purpose of death, when the deceased was engaged in perpetrating or attempting a crime less than felony, and where such killing would be, at common law, murder. Assisting in self-murder is manslaughter in the first degree, as also wilfully killing an unborn quick child by injury to the mother if it would be murder in case the mother died from the injury. The second degree consists in procuring abortion otherwise; killing in the heat of passion without the intent of death, but in a cruel and unusual manner; or killing unnecessarily one attempting to commit felony. The third degree is killing in heat of passion, without intent of death, but with a dangerous weapon; involuntary killing, by procurement or negligence of another, while the person killed is engaged in committing a trespass on property; suffering an animal known to be mischievous to go abroad without care, or keeping it without care, and thereby causing death; receiving wilfully or negligently so many persons into a boat or vessel as to cause death; racing while in command of a steamboat carrying passengers, bursting the boiler, and so killing; killing by a physician while in a state of intoxication. The fourth degree may be said to include all other modes or forms of manslaughter, known as such at common law, and of a milder kind than the preceding. See HOMICIDE.

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at Paris, in which Giovanni Francesco Gonzaga is seen returning thanks for the victory gained by him in 1496 over the forces of Charles VIII. The genuineness of this picture is, however, sometimes doubted. There are several others of his works in the Louvre, and an ‹Annunciation› in the Dresden Gallery.

Man'tell, Gideon Algernon, English geologist: b. Lewis, Sussex, 1790; d. London 10 Nov. 1852. For many years he practised as a medical man, and employed his leisure time in studying the strata and fossil remains of the weald district, by which he was surrounded. Through his investigations the fossilized skeletons of the Iguanodon and Hylæosaurus were discovered, the fresh-water origin of the wealden beds demonstrated, and many other important facts established in regard to the geology of that district. He published ‹The Fossils of the South Downs› (1822); ‹Illustrations of the Geology of Sussex› (1822); and the very popular ‹Wonders of Geology› (1838); and ‹Medals of Creation› (1844). His magnificent collection of fossils was purchased in 1839 for the British Museum.

Mantell, Robert Bruce, American actor: b. Irvine, Scotland, 7 Feb. 1854. He made his début upon the stage at Rochdale, England, in 1876, and in 1878 played in juvenile roles with Modjeska in the United States. He then spent three years in England as leading man, returning to New York to play with Fanny Davenport. He became a star and plays at the head of his own company, presenting the leading classical and romantic roles, including Hamlet, Macbeth, Romeo, Richelieu, etc.

Mantes, mänt, France, a town in the department of Seine-et-Oise, on the left bank of the Seine, opposite Limay, with which it communicates by two handsome bridges connecting the banks with an island in the river, 29 miles west-northwest of Paris. It contains a fine Gothic church, with two lofty towers; a beautiful Gothic tower, the only remains of the church of St. Maclou; and has manufactures of leather and saltpeter, famous breweries, numerous mills, and a trade in leather, corn, and wine. William the Conqueror (q.v.) received his death-wound at Mantes. Pop. (1901) 8,034.

Manteuffel, män'toif-fĕl, **Edwin Hans Karl,** BARON VON, German field-marshal: b. Dresden 24 Feb. 1809; d. Karlsbad 17 June 1885. He entered the army in 1827 and advanced rapidly, becoming lieutenant-general of cavalry 1861. He took part in the Danish war of 1864, and next year was appointed governor of Schleswig. During the war between Prussia and Austria he commanded the army of the Main, and fought at Hemstadt, Vettingen, Rossbrunn, and Würzburg. He served with distinction in the Franco-German War, especially in several actions around Metz, at Amiens, and from June 1871 to July 1873 he commanded the army of occupation in France, and was made field-marshal. In 1879 he was appointed governor-general of Alsace-Lorraine, and in this capacity showed singular want of skill and tact in ruling a conquered people.

Manti, măn'tī, Utah, city, county-seat of Sanpete County; on the Rio Grande, and on the Sanpete V. and the Western R.R.'s; about 125 miles south of Salt Lake City. Manti was settled in 1849 and incorporated in 1851. It is situated in an agricultural region, where sheep raising is one of the principal industries. Large coal mines are in the vicinity. The chief industrial establishments are creameries, flour mills, and machine-shops. The principal buildings are the Mormon temple, which cost $1,500,000, and the public school building. Pop. (1890) 1,950; (1900) 2,408.

Mantinea, măn-tĭ-nē'a̤, Greece, one of the most ancient and important cities of Arcadia, on the frontier of Argolis, on the little river Ophis. The site is now known as Palæopoli, and excavations and explorations by the French school at Athens have disclosed the foundations of the walls and buildings of the ancient city. Mantinea was known for its wealth, and famous for the battles fought near it; in 418 B.C., when the Argives, Athenians, and Mantineans were defeated by the Spartans. In 385 B.C., when the city was taken and destroyed by the Spartans and in 362 B.C., when the Thebans under Epaminondas defeated the Spartans, although the victory of the Thebans was purchased with the life of their commander. Mantinea was, in 226 B.C., surprised by Aratus; and in 222 B.C. taken by Antigonus Doson; on this occasion the town was sacked, and the inhabitants sold as slaves. Another battle was fought near Mantinea 207 B.C., between Machanidas, tyrant of Lacedæmon, and Philopœmen, general of the Achæan League. The latter was victorious, and slew the tyrant with his own hand.

Mantiqueira, măn-tē-kā'ē-rä, **Serra Da,** Brazil, a mountain range which is in the southeastern part of the republic. It is about 75 miles from the Atlantic and extends nearly parallel with the coast for about 200 miles. Ranges connected with the Mantiqueira are often included with this range and the name Mitiqueira applied to the whole. Mount Itatiaia, the highest peak, is 9,000 feet above the sea. Several large rivers have their sources in this range.

Man'tis, an orthopterous insect of the family *Mantidæ*. These curious insects, allied to grasshoppers, abound in many parts of the world, and have always excited popular notice, and have been endowed with many supernatural qualities by the ignorant and superstitious of all countries. They are slender, with long, locust-like legs, oval wings, and a long neck-like prothorax, terminating in an angular head with large protruding eyes. The front legs are stout, spiny, fitted for grasping their prey, and are held up in front of them in an attitude that to some suggest prayer. Hence the names praying insect, prophet and the like often given to the more familiar species; to others they suggest other ideas, as of a horse pawing the air, whence our common species of the Southern States (*Stegamomantis carolina*) is known as the «rear-horse,» and in Europe these insects are called «camel-crickets.» Why it should also be called «mule-killer» is harder to explain, probably it is by confusion with a scorpion also so called. These insects in tropical countries have come to assume various forms and hues similar to the flowers near which they lurk to catch the insects visiting the blossoms,— a protective measure which comes under the head of mimicry. A large proportion of the insects upon which they feed are injurious to crops, so that they may be regarded as beneficial to man. Among the Japanese and Chinese they are made to minister to human amusement also, being kept in cages and made to engage in combats upon which the spectators bet money. The eggs of the mantis are laid in an oval mass upon the stem of a plant, and covered with a tough case of hardened mucus, which shows a curiously braided pattern of surface, and is easily recognized.

Mantis Shrimp, a large crustacean (*Squilla empusa*) of the order *Stomapoda,* which dwells in burrows between tide-marks along our eastern coast, and seizes marine worms, and the like, that come within its reach. Its general shape is shrimp-like, but it has strong claws on the second pair of legs, which much resemble the forelegs of a mantis (q.v.), are provided with sharp spines, and are so jointed that they can be folded back upon themselves like the blade of a clasp-knife, and so take a firm grip upon the struggling captives. It is quite blind, although the eyes appear to be well formed. A well-known European species is gathered for food by the coast people.

Mantle, (1) a kind of cloak or loose garment to be worn over other garments. (2) In heraldry the name is given to the cloak or mantle which is often represented behind the escutcheon. (3) The name given an invention used on lamps and in gas lighting. See GAS, ILLUMINATING.

Mantling, in heraldry, an ornament depicted as hanging down from the helmet, and behind the escutcheon. It is considered to represent either the cointise, an ornamental scarf which passed around the body, and over the shoulder; or the military mantle, or robe of estate. When intended for the cointise, it is cut into irregular strips and curls of the most capricious forms, whose contortions are supposed to indicate that it has been torn into that ragged condition in the field of battle. When the mantling is treated as a robe of estate, the bearings of the shield are sometimes embroidered on it. A mantling adjusted so as to form a background for the shield and its accessories, constitutes an «achievement of arms.»

Mantraps, engines for the terrifying of trespassers and poachers (formerly often indicated by the warning notice «man-traps and spring-guns set here»), resembled gigantic rat-traps four feet long. They may be seen in museums; it is, since 1827, illegal to set them save indoors between sunset and sunrise, as a defense against burglars.

Mantua, măn'tū-ạ, Italy, a fortified northern town, capital of the former duchy, and now of the province of Mantua, 80 miles by rail southeast of Milan, on an almost insular site on the Mincio, which here divides into several arms ending in a marshy and insalubrious lake. Communication is maintained between the islands and mainland by several bridges, the chief of which is Ponte di San Giorgio, 800 yards long. Mantua is the see of a bishop, the seat of a civil, criminal, and mercantile court, and the residence both of a military governor and of a provincial delegate. The most remarkable edifices are the cathedral, after an elegant design by Giulio Romano; the church of Sant' Andrea, conspicuous from a distance by its majestic cupola and Gothic tower; the church of Santa Barbara, containing the mausoleum of Carlo

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and, in the first chapter of the law-book ascribed to him, he declares himself to have been produced by Virâj, an offspring of the Supreme Being, and to have created all this universe. Hindu mythology knows, moreover, a succession of Manus, each of whom created, in his own period, the world anew after it had perished at the end of a mundane age.

The word Manu — akin to «man» — belongs therefore, properly speaking, to ancient Hindu mythology, and it was connected with the renowned law-book in order to impart to the latter the sanctity on which its authority rests.

This work is not merely a law-book in the European sense of the word, it is likewise a system of cosmogony; it propounds metaphysical doctrines, teaches the art of government, and, among other things, treats of the state of the soul after death.

The chief topics of its 12 books are the following: (1) creation; (2) education and the duties of a pupil, or the first order; (3) marriage and the duties of a householder, or the second order; (4) means of subsistence and private morals; (5) diet, purification, and the duties of women; (6) the duties of an anchorite and an ascetic, or the duties of the third and fourth orders; (7) government and the duties of a king and the military caste; (8) judicature and law, private and criminal; (9) continuation of the former and the duties of the commercial and servile castes; (10) mixed castes and the duties of the castes in time of distress; (11) penance and expiation; (12) transmigration and final beatitude.

Bühler has proved that Max Müller was right in regarding the extant work as a versified recast of an ancient law-book, the manual of a particular Vedic school, the Mânavas; and holds that the work, the date of which used to be given at 1200 B.C., was certainly extant in the 2d century A.D., and seems to have been composed between that date and the 2d century B.C. There are many remarkable correspondences between this work and the Mahâbhârata, suggesting the use in both of common materials.

Manual Acts, in ecclesiastical and church history, acts performed by the hands of the celebrant in the mass, chiefly the fraction of the host, and making the sign of the Cross over it before consecration. Both were objected to at the Reformation.

Manual Alphabet, the deaf and dumb alphabet; the letters made by deaf and dumb persons with their fingers.

Manual Exercises, the exercise or drill by which soldiers are taught to handle their rifles and other arms properly.

Manual Training, a term which, according to the best usage, signifies the systematic study of the theory and use of common tools; the nature of common materials; elementary and typical processes of construction; and the execution and reading of working drawings; and the study of cookery, sewing, printing, etc. The materials referred to are wood, metals, alloys, and plastic minerals; the drawing includes both freehand and instrumental, with pen, pencil, and brush. The systematic study of tools, processes, and materials is the essential feature of manual training; hence the incidental use of tools without system for some ulterior object, is not manual training. There is of course a suggestion of manual training when the teacher shows a child how to handle a pitch-fork; when a woodman teaches a novice how to swing an axe in cutting down a tree; when a foreman shows a green hand how to head a pin. Yet such cases are usually without system and continuity; and accordingly are excluded from the content of manual training. One does not give a boy manual training by turning him loose in a shop, any more than he gives a literary education to a boy who cannot read by locking him in a library. It follows that the manipulations of the kindergarten, the «busy work» in the primary grades on the one hand, and the science laboratory and the commercial workshop on the other, are beyond the pale of manual training.

Manual training proves to be a far better thing than was expected when the name was first used and when the first manual training school was opened, and the present purpose and object of manual training is stated so broadly and philosophically that the statement published for many years in the catalogue of the Saint Louis manual training school seems very modest; to wit: (1) To furnish a broader and more appropriate foundation for higher technical education. (2) To serve as a developing school where pupils could discover their inborn capacities and aptitudes, whether in the direction of literature, science, engineering, or the practical arts. (3) To furnish to those who look forward to industrial life opportunity to become familiar with tools, materials, the methods of construction, and exact drawing, as well as with mathematics, elementary science, and ordinary English branches.

Manual training is essentially a culture study; its function is to develop the child by developing the brain and increasing its control over materials through the hand and eye. In early years the work of a child is qualitative rather than quantitative. Physiologists tell us that the areas of the brain develop gradually and unequally; that a normal child does not recognize accuracy and that he is incapable of precision either in ideas or deeds until he is several grades along in school. Tool work should result in accuracy in thought and in deed, and hence should not be attempted before the sixth or seventh grade. Dr. C. H. Henderson defines Manual Training as «quantitative handicraft.» He adds: «The brain grows by what it feeds upon. Given perfect health and a wealth of sense-impression, especially a wealth of quantitative sense-impression, that is to say, well-trained senses, and we have the physical basis for a full intellectual life. Without this large quantitative knowledge and developed brain, we live in a world of illusion, a guess-world of very imperfect rationality. To cultivate the hand and eye and ear, even the nose and the tongue, is to enlarge the material of thought and the tool of thought.» In 1882, before the National Educational Association at Saratoga, the writer of this article defined Manual Training as «a new art of expression,» in the concrete, as contrasted with verbal description, and graphical representations. This view of manual training has been much elaborated of late, with the result that «expression» is by many persons regarded as the very essence of manual training. This result is unfortunate, since it confuses «expression» with the «art of expression.» The former is a product of manual training; the logical study of the «art» constitutes the sum and substance of the educational feature known as manual training.

All arithmetical operations depend upon the «fundamental rules»; the scientific study of a language begins with declensions and conjugations. So tool-work, drawing, needlework, cooking, etc., begin with fundamental processes with typical appliances upon typical materials. The articles constructed, the figures drawn, the garment sewed, or the dishes cooked, are incidental like blackboard work in long division, and like them they are valuable because they involve effort and result in mastery and power. The real end and aim of all education, whether «manual» or «spiritual,» is the developed, strengthened, disciplined, executive person, regardless of the fate of the exercises or products which were the means of his development.

Originally, when manual training first took definite form in school education, it was generally assumed that it was intended to supersede the old form of trade apprenticeship, and not a few people defended and supported it on this ground. Because a boy learned how to use tools, how to keep them in order, and how to treat the common materials of construction, it was claimed that he was learning a trade, or several trades, and so the manual training school was regarded as a trade school. In spite of the fact that this assumption and this claim were both wrong, the practical value of the boy's knowledge of tools and skill in their use was for some years regarded as the chief evidence of the value of manual training.

In all ages men have recognized the value of skill in the use of tools and the processes of construction. The mythical Vulcan, the Jewish Tubal Cain, the Greek Dædalus, Archimedes of Syracuse, the Miltonian Memnon, are familiar examples. The greatest invention of the ages has been the generation, transmission, and utilization of mechanical power, and along with it has come the invention and use of tools. Rousseau advocated systematic instruction and practice in the details of a trade or occupation; and Carlyle in words now familiar to us all declared that man was a tool-using animal; that without tools he was nothing; with tools, he was all. In every land men advocated the learning of a trade for a livelihood, or for culture; witness, Peter the Great of Russia; the King of Prussia; and the New England seer, Emerson — but in all cases it was taken for granted that the only avenue to mechanical skill and culture lay through an apprenticeship to a builder or manufacturer. Schools were for the study and mastery of books. The arts of the schoolroom were for masters and freemen, hence they were noble, and were called the liberal arts. The arts of the mechanic were for serving men, and were acquired only by intimate association with mechanics; so the practical arts were held to be degrading, because requiring a base companionship.

Later the invention of machinery and the use of costly machine tools so far modified and limited apprenticeship as almost to ruin it. Trade schools sprang up all over Europe, and native American skilled mechanics ceased to exist. Numerous «manual-labo
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Great as is the economic and industrial value, the effect upon the mind and the heart is of far greater value. A recent writer, looking at the reflex action of manual training upon the pupil, maintains that when «rightly conceived and carried on, it promotes co-ordination, it develops creativeness, it broadens culture, it strengthens character.» Nevertheless objections occasionally appear, some of which are extremely amusing. One opponent says: «I am opposed to teaching boys how to be sticks in all cases of emergency. You put a lad into a palatial shop and teach him how to be helpless all the rest of his life because he hasn't the tools handy.»

In Germany where educational manual training was first introduced in 1886, there was violent opposition, partly because it was thought to be purely industrial, and partly on the general ground that manual training had not a single valid claim to entrance into the school programme. For arguments pro and con the reader is referred to the Reports of the United States Commissioner of Education and those of the National Educational Association for the years 1883–1894 inclusive. Active opposition practically ceased in 1890.

In 1904 there was in nearly every large city at least one manual training high school, and there were hundreds of secondary schools in which more or less manual training is available as an optional study. The European plan of making it a pure «extra» to be taken after hours is in little favor in the United States. No sooner was manual training shown to be a valuable educational feature in secondary schools than numerous efforts were made to introduce it into grammar schools in an elementary form. Hundreds of experiments have been tried with carefully selected lessons in wood, with hand tools only. In this study of tools and methods the Swedish Sloyd (so called) has served a very useful purpose in the way of suggestions. It is true the wooden spoons and ladles of Sweden have disappeared, and careful drawing as a preliminary to tool work has come into being, but the value of presenting a «motive» to a young child quickly became evident. An older pupil appreciates the theory of a tool and is at once interested in its peculiar construction, its range of service, and the correct ways of using it, just as an older boy is interested in the study of a rifle and in shooting at a mark, knowing that men use rifles for shooting at game, burglars, and public enemies. Children of from 10 to 14 years of age are always anxious «to make something,» though generally quite unable to do so in a fruitful manner. They are incapable of good workmanship and impatient under criticism of matters to which they have given little or no thought. They are interested in finished objects, not in the sequence of steps, not in accurate measurements, close fits, and the use of the right tools in the right ways. Hence the greatest care is necessary in elementary grades that the exercises are simple, involving few elements, and that they are capable of analysis into steps which the child can fairly appreciate. Above all he must learn when and how to use each particular tool.

In England manual training is more often called technical education, and it is more often than not associated with trades, and even this in a majority of cases is given in evening schools. There is as yet in Great Britain no general conviction that manual training is essential to intellectual development and that its moral influence is wholesome and strong. Accordingly it is planned for working people chiefly. Undoubtedly the educational value of tool work of the most elementary character as developed by Dr. Solomon of Sweden has had great influence in England, but manual training of a severer and more intellectual sort owes its establishment largely to Sir Philip Magnus of London, Sir William Mather of Manchester, and Prof. Ripper of Sheffield. Sir William has not only encouraged its introduction into Manchester schools, but has built and equipped a «Department of Manual Training and Technical Instruction» in Gordon College, Khartum, in Sudan, for the benefit of Sudanese boys. There is an abundance of elementary manual training in France, particularly in Paris, but no sooner is the boy old enough and strong enough to learn a trade than he is put at trade work. The French are convinced, as indeed are all nations, that the principles and details of a trade like the fundamental principles of a profession may be most successfully taught in a special school connected with a commercial or manufacturing establishment. Hence all the fine specimens of metal work exhibited by French educational institutions are the work of special or trade schools. Educational tool work is found in Australia, Japan, China, India, and in South America.

The Methods of Tool Instruction.— Methods vary greatly, not only with pupils of different grades where variation is necessary, but with different teachers in the same grades. While children of 12 years can be taught to care for and properly use some edge-tools, instruction in regard to the theory of machine tools, the laws of heat and friction, the theories of strength and stiffness are beyond them. In the hands of an expert every good hand tool has abundant theory and elegant uses. These should be carefully taught and illustrated. A manual training school is a place where the care and use of tools, details of processes, natures of materials, and the essential forms of construction are systematically explained and taught. No school omitting such systematic work is worthy of the name. Manual training, like instrumental music, is something to be taught, something to be studied and learned. The notion is too prevalent that the pupil must be left to find out how tools are to be used, and how the parts of a construction are to be joined — by himself without the aid of the teacher. One writer says «the pupil makes what he wants to make, and what he does not want to make is left unmade. He usually decides without help from the teacher. He is at liberty to go ahead and work out his own ideas rather than those imposed by the teacher.» The trouble is that the novice, whether pupil or teacher, has no mechanical ideas worthy of serious consideration. The mechanic arts like other arts which have been slowly developed by study and research, should first be taught in all their fulness by one who has analyzed them into fundamental principles and processes, and who is an expert in teaching them. Both research and manufacture may properly supplement the course in a mechanical laboratory. Moreover, for the sake of clearness and fulness, the class method of instruction should be used. Assuming a well graded class (and the assumption is as reasonable in manual training as in any other study), the exposition and demonstration is far more logical and thorough when given to the class, as a whole, than when given in fragments and gestures to individuals. The place for individual instruction is in supplementing class instruction for the benefit of special pupils. The class method means progress as a class, as is generally the case in academic branches.

Long experience justifies the class method. Let the pupils be comfortably seated about the teacher, who should be equipped with a standard set of appliances. Every pupil should be able to see, hear, and to make notes or sketches. The statement of principles and theories and practical demonstration should rarely occupy one fourth of the laboratory period. The style and workmanship of the teacher should be as nearly perfect as possible. His handwork should always be accessible for inspection and model; he should never begin work for his pupils to finish, or finish work they have begun. Be it ever remembered that not the finished exercise, but the *doing of it,* is the main thing. The course of study in a particular laboratory should always be logical, never difficult, and more or less original every year. Like a flight of steps on a steep incline, the lessons should be suited to the pupils, without useless repetitions and without needless complications. The meaning and purpose of every lesson should be clear, and at its end the sense of mastery should reward every pupil. Synthetic exercises should follow the elements at intervals, more frequently with young pupils than with older. Such combinations stimulate zeal and show the logic of the course. A finer construction may end the course in each laboratory, but its educational value must not be over-estimated.

The Programme.— Seventh and eighth grade pupils may have one lesson a week in elementary work, not exceeding 2 hours in length. The ninth, tenth and eleventh grades may have 2 lessons per week in tool-work, and 2 in the rudiments of drawing and lettering, each lesson covering two school periods. The twelfth grade may extend the length of a lesson over three periods in the machine-tool laboratory, but have fewer lessons per week. The length of the lesson should depend upon the capacity of the pupils to give close attention to the work in hand. When attention fails, education stops. With the younger classes the full length of the lesson should not be given to one kind of occupation. For instance, let the plan be: A few minutes to general criticism of last exercise; a few to exposition and demonstration; a few to making or reading the working drawing; the remainder to steady work on the «regular» or an «extra» exercise. The element of comparison and criticism, by both pupil and teacher, should never be neglected. The standard should ever be reasonable perfection.

Size and Equipment of Laboratories.— Every laboratory should have from 40 to 60 square feet of floor space per pupil; the floor should be dry and warm; the room should be well lighted and ventilated; all moving machinery should be driven by an electric motor under the

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ration, needle and sewing-machine work, garment cutting and fitting, cooking and household economics. See TRADE SCHOOLS.

CALVIN M. WOODWARD,
Washington University, Saint Louis, Mo.

Manucodia, măn-ū-cō'dĭ-ạ, in ornithology, a group of birds either belonging or closely allied to the *Paradiseidæ*, and peculiar to the Papuan sub-region. The plumage is glossy steel-blue; the outer and middle toes are united for some distance, and there is an extraordinary convolution of the trachea in the males, to which the loud and clear voice of the birds is owing. Mr. Sharpe divides the Manucodia into two genera: Phonygama (q.v.) and Manucodia proper, of which four species are admitted. *Manucodia chalybeata* (*chalybea*), from the northwest, and *M. comriei*, from the southwest of New Guinea; *M. atra*, widely distributed over the Papuan sub-region, and *M. jobiensis*, peculiar to the island whence it derives its specific name.

Manuel I., Comnenus, man'ū-ĕl kŏm-nē'-nŭs, a Byzantine emperor: b. about 1120; succeeded his father, Joannes II., in 1143, died in 1180. The valor which he had displayed against the Turks induced his father to bequeath the crown to him rather than to his elder brother Isaac, who was immediately imprisoned by Axuch, the minister of the deceased emperor. Returning from his campaign in Cilicia, Manuel was received with enthusiasm at Constantinople, but was at once involved in wars both in the East and the West, which lasted with brief intermissions through his reign. In 1144 he subjected Raymond, the rebellious Latin prince of Antioch. In 1145 he defeated the sultan of Iconium in successive pitched battles. In 1147 he promised his aid to the new crusade headed by Louis VII. of France and Conrad III. of Germany, and though he allowed them a passage through his dominions he gave secret information to the Turks.

In 1148 he began the most important war of his reign with Roger, the Norman king of Sicily, who had taken Corfu and prepared to invade Greece. He formed an alliance with the Venetians, who within a year joined him before the fortress of Corfu, which was surrendered after an obstinate siege. He was prevented from invading Sicily by hostilities of the Servians and Hungarians, instigated by Roger, the former of whom were vanquished in two campaigns, but the latter protracted the war till 1152. In that year he suffered a reverse from the Turks in Cilicia, but his general, John Ducas, gained so great successes in southern Italy that Manuel conceived the project of reuniting the eastern and western empires.

The defeat of Alexis, the successor of John Ducas, by William, the successor of Roger, soon followed; the Sicilian admiral Maius routed the Greek fleet off Negropont, and advanced toward Constantinople; and Manuel therefore accepted an honorable peace in 1155. Those Greek prisoners who were silk-weavers were retained in Italy, and gave origin to the flourishing Italian silk manufactures. In the following years he waged successful wars with Raymond, prince of Antioch, and Az-ed-din, the Turkish sultan. A new war soon broke out with Gejza, king of Hungary, which was terminated by a disastrous defeat of the Hungarians near the present Semlin. In 1176 he experienced a terrible defeat from Az-ed-din in the mountains of Pisidia, and was obliged to sign a disadvantageous peace. By breaking the treaty and renewing the war he obtained honorable terms. Depressed by this disastrous expedition, he never recovered his former military enterprise and ambition. The heavy war taxes levied from his subjects during his reign were often employed in pensioning ministers and men of influence at foreign courts, while his troops went unpaid.

Manuel II., Palæologus, pā-lē-ŏl'ō-gŭs, a Byzantine emperor, born in 1348, succeeded his father Joannes V. in 1391, died in 1425. At the death of his father he fled from the court of the sultan Bajazet, with whom he had been left as a hostage. The consequence was a war with Bajazet, in which Manuel was supported by an army of Hungarians, Germans, and French. The allies, under the command of Sigismund, king of Hungary and afterward emperor of Germany, were defeated at Nicopolis in 1396, with the loss of 10,000 men. Constantinople was besieged, and its fall seemed impending, when the conquests of Tamerlane diverted the arms of the sultan. Manuel visited Italy, France, and Germany, vainly seeking assistance from the western princes. In the conflict between the Tartars and the Turks, he acted with diplomatic skill, and secured peace to his empire. He sent ambassadors to the council of Constance with instructions to urge a union of the Latin and Greek Churches; but his real object was only to obtain aid from the kingdoms of the West, and to alarm the Turks by the negotiations with those kingdoms.

Manuel, Don John, Spanish prince and author: b. Escalona, Spain, 5 May 1282: d. 1349. He was a nephew of Alfonso X., and cousin of Sancho IV. His public life was a restless and turbulent one, but his chief claim to remembrance comes from the fact that he was one of the first and one of the best of Spanish prose writers. He wrote in a style of singular simplicity and charm, and few Spanish authors have succeeded so well in giving to their words the calmness, the weight, the richness which come only from long experience and reflection. His principal work that remains is ‹Libro de Patronio,› more commonly known as ‹El Conde Lucanor,› which has been translated into the French and German languages.

Manufacturers, National Association of, an American association organized in Cincinnati in 1895. It had three primary objects, increasing the export trade; influencing State and National legislation; and arbitrating labor disputes. The association maintains a general office in New York city and issues numerous confidential reports and bulletins for the exclusive use of its members. The association is opposed to trade-unionism. In 1903 it had nearly 2,000 members. It publishes ‹American Industries› (semi-monthly), and ‹The American Trade Index› (monthly).

Manufactures, American. See AMERICAN MANUFACTURES.

Manumis'sion, in Roman law, the solemn ceremony by which a slave was emancipated. Constantine the Great allowed the Christian masters to emancipate their slaves before the altar on festival days, and especially at Easter, by placing the deed of emancipation on the head of the freedman in the presence of the congregation. See EMANCIPATION: EMANCIPATION IN LATIN AMERICA; EMANCIPATION PROCLAMATION.

Manures and Manuring. See FERTILIZERS.

Man'uscripts (Latin, *manuscriptus*, written by the hand), are literally writings of any kind, whether on paper or any other material, in contradistinction to printed matter. Previous to the introduction of printing all literature was contained in manuscripts. All the existing ancient manuscripts are written on parchment or on paper. The paper is sometimes Egyptian (prepared from the real papyrus shrub), sometimes cotton or silk paper (*charta bombycina*), which was invented in the East about the year 706 A.D., and used till the introduction of linen paper, and in common with this till the middle of the 14th century; sometimes linen paper, the date of the invention of which, though ascribed to the first half of the 13th century, on the authority of a document of the year 1243, written on such paper, is nevertheless exceedingly doubtful. The earliest mention of quill pens is in the seventh century. The most common ink is the black, which is very old. The oldest, however, was not mixed with vitriol, like ours, but generally consisted of soot, lamp-black, burned ivory, pulverized charcoal, etc. Red ink of a dazzling beauty is also found in ancient times in manuscripts. With it were written the initial letters, the first lines, and the titles, which were thence called *rubrics*, and the writer *rubricator*. More rarely, but still quite frequently, blue ink is found in ancient manuscripts; yet more rarely green and yellow. Gold and silver were also used for writing either whole manuscripts (which, from their costliness, are great rarities), or for adorning the initial letters of books. With respect to external form, manuscripts are divided into rolls (*volumina*, the most ancient way, in which the troubadours in France wrote their poems at a much later period) and into stitched books or volumes (properly *codices*). Among the ancients the writers of manuscripts were mainly freedmen or slaves (*scribæ librarii*). Some of the professional copyists in Rome were women. When Origen undertook the revision of the Old Testament (231 A.D.) St. Ambrose sent to his assistance a number of deacons and virgins skilful in caligraphy. Subsequently the monks, among them the Benedictines in particular, were bound to this employment by the rules of their Order. In all the principal monasteries was a *scriptorium*, in which the *scriptor* or scribe could pursue his work in quiet, generally assisted by a *dictator*, who read aloud the text to be copied; the manuscript was then revised by a *corrector*, and afterward handed to the *miniator*, who added the ornamental capitals and artistic designs.

It is more difficult to form a correct judgment respecting the age of Greek manuscripts from the character of the writing than it is respecting that of Latin manuscripts. In general it is to be remarked that in a Greek manuscript the strokes are lighter, easier, and more flowing the older it is, and that they become stiffer in the progress of time. The absence or presence of the Greek accents is in no respect decisive. Some Greek papyri are earlier than the Christian era, but most are not earlier than about the 6th century. The
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painted pages of the Byzantine manuscripts. At first the initial letters were of the same size and color as the text, but the Syriac manuscripts of the 7th century have them with a pattern or border. They soon increased to a great size, being in some cases 24 inches in length. They were most used in the 8th and 9th centuries. They at last degenerated to the last decadence of art, the grotesque. From the 8th to the 11th century the initials in use were composed of figures of men, quadrupeds, fishes, birds, etc. The initials of the 12th century are made up of masses of conventional foliage interspersed with the animal figures of the preceding centuries. Continuous borders, with vignettes, tail-pieces, etc., were also prevalent in later times, and some manuscripts are ornamented with very artistic designs. The English and French manuscripts may be recognized by their delicate light-blue and green colors; those of Flanders by the heaviness of their drawing and the dark hues of the coloring. In Italy and Spain the tortuous patterns of animals and flowers were painted in bright colors and gold. In the early Irish manuscripts the figures are rudely drawn; the writing is large and bold, and the capitals profuse. The peculiarity of this style is the use of dots, generally in red, following the outline of the initials; delicate spiral lines, interlaced ribbons, and tesselated patterns. The most interesting specimens of this style are the Book of Kells at Dublin, and the Durham Book in the British Museum. In the 16th century the art became extinct. Some attempts have been made to revive it by adorning paper, parchment, and vellum with designs in color or metals.

Manutius, mạ-nū'shĭ-ŭs, **Aldus** (Ital. Manuzio, Manuzzi and Manucci), Italian printer: b. Sermonetta, near Belletri, in the neighborhood of Rome (and, hence commonly known as Romanus) 1450; d. 6 Feb. 1515. He began his studies at Ferrara, and continued them at Rome where he was tutor to princely families. He learned Greek in Ferrara under Guarini and at the suggestion of the Prince di Carpi established a printing-press at Venice 1489. He gained the reputation of being learned in Greek, Hebrew and Latin and entertained in his house many scholars of the day, forming his «Neacademia» or New Academy, which later was styled «Academia della Fama.» He was the author of ‹Dictionarium Græcum› (1497); ‹Institutiones Græco-Latinæ› (1501–8); ‹Grammaticæ Institutiones Graecæ› (1514); ‹De Metris Horatianis› (1509). His son PAULUS (b. 12 June 1512; d. 6 April 1574) continued (1533) to manage the printing-press at Venice, and subsequently (1561) presided over the papal press, Typographia Vaticana, at Rome. He wrote a commentary to Cicero's Letters, and ‹Epistolæ Selectæ.› ALDUS, the younger, son of Paulus (b. 13 Feb. 1547; d. Rome 28 Oct. 1597), was a scholar and author from his earliest youth. He continued his father's work at Venice and Rome. Consult: Renouard, ‹Annales de l'Imprimerie des Aldes› (1834); Didot, ‹Alde Manuce et l'Hellénisme à Venise› (1873); Goldschmid, ‹A Biographical Sketch of the Aldine Press at Venice› (1887); Omont, ‹Catalogues des Livres Grecs et Latins, imprimés par Alde Manuce à Venise› (1892). See ALDINE EDITIONS.

Manx Cat, a breed of house-cats, originating in the Isle of Man, which are characterized by very high hindquarters, and, as a rule, by a very short tail. See CAT.

Manzanillo, män-thä-nēl'yō, Cuba, city, port of entry, in the western part of the province of Santiago de Cuba, on the Gulf of Guacanabo. It has a large harbor which is protected by a number of small islands. The city is the port for Bayamo, an inland city about 40 miles east by north from Manzanillo. The low land and the mangrove swamps around the place make it very unhealthy. It is well built and has a number of fine churches, hospitals and schools,—among the schools four are high schools. Pop. 15,115.

Manzanillo, Mexico, seaport, in the state of Colima; on the Pacific at the entrance to the Bay of Cuyuttan; about 40 miles west of Colima, the capital of the state. A railroad connects Manzanillo and the capital, and the city has steamer connections with the principal ports on the Pacific coast. Pop. (1902) 4,187.

Manzani'ta, a popular name for various species of *Arctostaphylos* of the order *Ericaceæ*, especially *A. fungens* and *A. manzanita*, which are considered identical by some authors. They are shrubs or small trees which sometimes exceed 20 feet in height, and often form impenetrable thickets in the Rocky Mountain region from Oregon southward. They have alternate, evergreen entire leaves, usually white or pinkish flowers in long-panicled racemes and generally smooth berry-like drupes. Another well-known species often called by this name is the bearberry (q.v.), a trailing evergreen shrub which extends from the Arctic region to the mountains of Mexico, whose red berries form one of the principal foods of ptarmigan and other related birds. The great-berried manzanita (*A. glauca*), a California species, bears fruit more than half an inch in diameter. Of the 30 species of the genus, probably a dozen are used for ornamental purposes; some Central American ones in greenhouses where the climate prevents outdoor use; the shrubby western kinds in mild climates; and only the trailing kinds in cold localities. The gnarled roots are an important resource for fuel in the untimbered parts of California.

Manzano, Juan Francisco, hoo-än' frän-thēs'kō män thä'nō, Cuban poet: b. Havana, August 1797; d. there 1854. A negro slave he wrote and published several volumes of verse before he was manumitted (1837), gaining especial fame by ‹Mis treinta Años› (1836), translated into French, German and English, and by ‹Apuntes Autobiográficos,› which was never printed in Spanish, but was published in English by Richard Robert Madden in 1840 under the title ‹Poems by a Slave in the Island of Cuba recently Liberated.› Manzano's other works include ‹Cantos à Lesbia› (1821), several excellent lyrics reprinted in Calcagno's ‹Poetas de Color› (1868), and a drama ‹Zafira› (1842).

Manzanos, män-zä'nōs, a natural park, in Lincoln, Bernalillo, and Santa Fe Counties in New Mexico, southeast of Albuquerque. The Manzano Range, the highest peak of this section, numerous table-lands, and valleys, with many springs and small streams, are the chief features of this park. The Rio Grande is on the west side; the base of the mountains is about 1,000 feet above the river, and about 11,000 feet above the level of the sea. The almost perpendicular, stupendous red cliffs which rise above the plain and form the western face of the mountains, are almost unscalable. South of the red-cliff region is the cañon of Las Moyas; and south of this cañon Bosky Peak, the highest point of the range. Near the summit of the peak is a spring which gushes up in a lake about 50 feet wide.

The view from the summit of the range at some points includes the green valley of the Rio Grande, mountains west of Albuquerque, and north to the walls of Santa Fe, and intervening valleys and mountains. On the west of the park, or the western border, are the white Manzano salt lands, on the southeast the gypsum desert. On the level mountain tops are stretches of clearing where the grass grows luxuriantly. Between Hell Cañon and Chilili is a region of immense pine and piñon forest. Some of the animals found here are deer, bear, and wild turkey. Grains, vegetables, alfalfa, fruit and other farm products are raised. Sheep, horses, and cattle are raised extensively.

Manzoni, män-zō'nē, **Alessandro,** Italian poet and novelist: b. Milan 7 March 1785; d. there 22 May 1873. He studied at Milan and Pavia, and published in 1806 his poem on the death of his friend Imbonati, which was followed in 1815 by his 'Sacred Hymns' ('Inni Sacri'). In 1819 appeared his first tragedy, 'Il Conte di Carmagnola,' the first drama in which an Italian defied the unities. This play was reviewed and praised by Goethe, who took a warm interest in every subsequent production of Manzoni. The death of Napoleon inspired one of the finest odes of the century, 'Il Cinque Maggio' ('The Fifth of May'). In 1823 his second tragedy, 'Adelchi,' appeared. This, as well as its predecessor, finds more favor in the closet than on the stage. After this Manzoni divided his time between country pursuits at his residence in the neighborhood of Milan, and the composition of his romance 'I Promessi Sposi' ('The Betrothed'), a Milanese story of the 17th century, published in 1827, and which has been translated into most of the European languages (Eng. in Bohn's library 1883). He strove earnestly to make Tuscan the universal language in Italy. As a poet he outrivaled all his Italian contemporaries. Verdi's 'Manzoni Requiem' is a magnificent musical tribute to his memory. Consult: Sauer, 'Alessandro Manzoni' (1872); Stoppani, 'I primi anni di A. Manzoni' (1874); Bersezio, 'A. Manzoni, studio biografico e critico' (1873); Cambu, 'A. Manzoni, reminiscenze' (1885); Waille, 'Le romantisme de Manzoni' (1890).

Maoris, mä'ō-rĭz or mow'rĭz, native inhabitants of New Zealand, a people of Polynesian race, as is attested not only by ethnological considerations but by their own legend that they came from Hawaiki (Hawaii or Samoa). Their carefully kept genealogies go back less than a score of generations, so that it seems probable that their coming to New Zealand was four or five centuries ago. Remains of a previous population with Papuan characteristics have been found. The Maoris are well built, with longer bodies and shorter legs than the European type; they have black hair, little whisker on the face, and smooth bodies, wide open, straight black eyes, heads slightly macrocephalic, the index being 77, nose straight, and color slightly brown. Their costume, no doubt adopted only upon their coming to a colder country than their early

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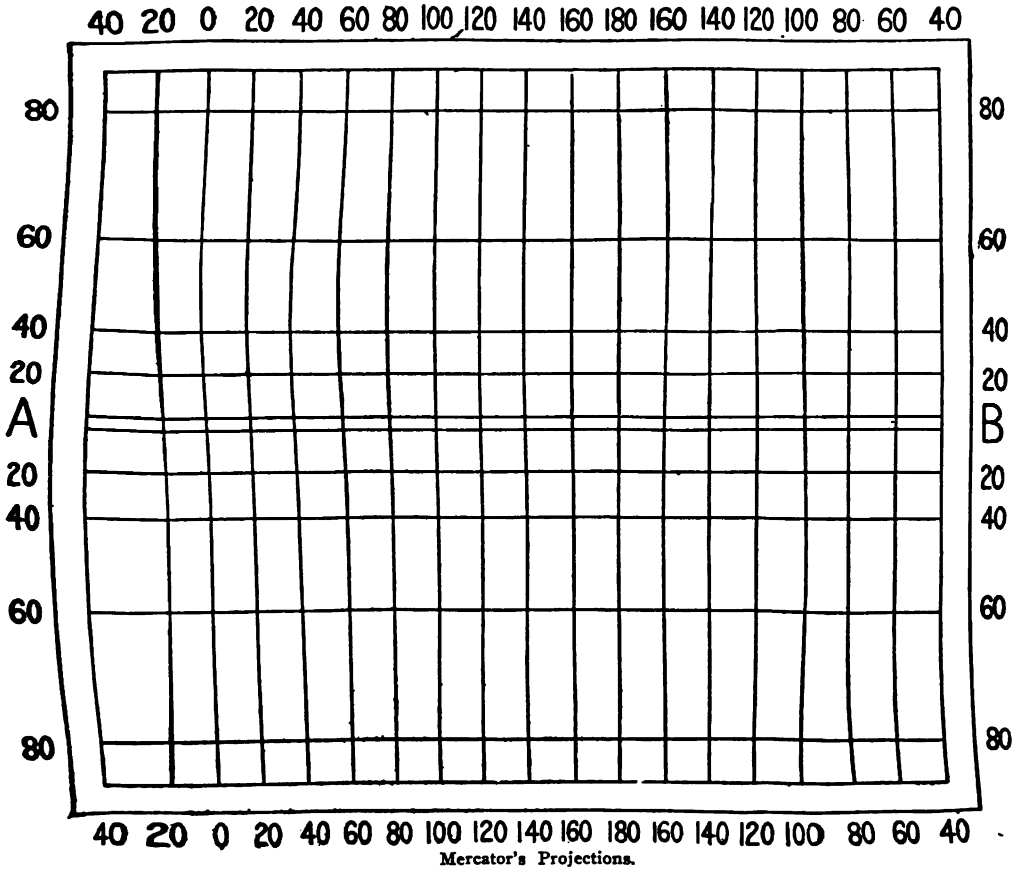
ably the first to use cartography (chart writing) but all these early maps were, of course, constructed on the supposition that the earth was flat, a plane. The spherical theory was adopted after Aristotle and Pytheas first made use of astronomical observations in geography. To Dicæarchus is given the credit (310 B.C.) of making crude attempts at proper projection of the sphere on a plane surface, though it was not until the teaching of Ptolemy (150 B.C.) that much real progress was made. From then on the science of delineating in proper proportion the earth's surface languished until the period of discovery and enterprise of the 15th century. Italian nautical charts were at that time fairly accurate, in so far as the earth's surface was then known. Between 1452 and 1552, great strides were made, such men as Sebastian Cabot, Johan Stoffler, Apianus and Mercator leading the way. The simple system of projection outlined by the latter remains unchanged, practically to this day, for the use of navigators. France has ever been most active in map and chart production. In the 18th century she made a state survey which was unsurpassed in accuracy up to that time. It later years, Great Britain and the United States stand in equal prominence in this field. SEE CHART.



Mercator's Projections.

With the knowledge of the earth's roundness came much vexation to the map-maker. It was easy enough to draw a few straight lines and suppose them accurate, when it was thought the world was flat. But it was manifestly impossible to portray a sphere upon a plane, like a piece of cloth or paper, in any ordinary way. So most of the early students of geography made more or less huge globes on which to trace their ideas of the relative situation of the several countries. Gradually, however, the science of projection was evolved, whereby the observer was supposed to stand at a distance from the earth's surface and *project* its image upon a flat surface, as is done on a screen by a stereopticon, or magic lantern. There are many systems of projection used in modern map-making, the most in use being the globular, or equi-distant (see plate), for representations of large parts of the earth's surface, or the whole of it.

To readily understand this method of projection, suppose an orange have a circle drawn about it at its exact centre and another circle passing through its stem, crossing the first circle at right angles, each in the exact centre of the orange. Call the first circle the equator (equi-distant from the stem, or *poles*) and the other circle the central meridian. Continue drawing circles about the orange, each equally distant from the other, one set representing the lines of latitude and the other those of longitude. This figure, cast upon a screen, would give you the projection shown in the illustration. It is manifest that only one side of a sphere can thus be shown upon a plane surface, so the map of the world is necessarily divided into two parts each called a *hemisphere,* it being usually so arranged that the Old World, or Eastern Hemisphere, is shown as one side of the sphere and the New World, or Western Hemisphere, in the other projection.

When it is desired to show limited areas of the earth's surface, the Conical Projection is often used (see plate). Inasmuch as the cone and cylinder most nearly approximate in form the sphere, this method can be used with sufficient accuracy to answer all practical purposes. The conical projection is supposed to be made from a position somewhat above the nearest pole, which point forms the apex of the cone. From this point a central, or meridional, perpendicular is described, meeting a base line at right angles. From the apex as a centre, draw partial circles to form the parallels of latitude. The exact point to use as a centre will be the point in the perpendicular where the top of a cone, cutting the globe at the two central parallels, would meet the axis of the sphere. This point will be found to be beyond the pole, at the place from which the eye of the alleged observer is supposed to be. This is a simple form of projection for small maps and is considerably used.

But of all the various methods of projection, none was suitable to charts for the use of seamen, as, if they were followed, the course of the ship would necessarily follow in a curved line, along the circular projections of latitude and longitude. So Mercator undertook to formulate a system that could be reduced to practical working along straight lines for the navigator. It is a cylindrical projection in which all the meridians are straight lines perpendicular to the equator and all the parallels straight lines paralled to the equator. See LATITUDE; LONGITUDE; MERIDIAN.

After this difficult matter of the proper projection of the sphere upon a plane surface was satisfactorily accomplished, then came the more mechanical part of map-making. The taking of accurate surveys of the territory to be delineated (see SURVEYING) having been accomplished, the tracings of boundaries, rivers, mountains, bodies of water, etc., was laboriously done by hand on parchment, in the olden days. Each such map was necessarily very costly and difficult to reproduce. With the gradual development of printing and lithography, most of these difficulties began to disappear. Still, the original had to be laboriously engraved by an artist upon the lithographing stone or plate of steel or copper. This made the primal cost heavy. The perfecting of photo-engraving helped to reduce this cost, but it was not until the discovery, in comparatively recent years, of the simple method of wax engraving for producing map plates that real beauty and cheapness, combined, was possible.

Wax engraving has itself undergone so many improvements of late that the whole method has, practically, been changed since 1900. Now it is possible to photograph directly upon the wax plate, as a guide, infallible, for the engraver. The present method is as follows: A polished copper plate, the size of the proposed map, or a certain section of it, is coated with a nitrate of silver solution, so that the copper in the making

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nary map in the several colors — red, blue, yellow, brown and black. An idea of the various stages of this decidedly American method of map-making is given in the illustration.

One of the large firms of New York City, engaged in wax engraving, did over $75,000 worth of business in this line in 1902. The making of maps for encyclopædias, geographies, atlasses, cities, counties, etc., has increased marvelously since the newer and less expensive method herein described has come into use. A map the size of the page used in this Encyclopedia can be made for from $75.00 to $100.00, which formerly cost as much as $1,000. In producing very large and coarse maps, the stencil method is followed quite generally. This consists in cutting out the lines desired for one of the colors from a sheet of paper, made transparent and water-proof by the application of a pitchy compound. This sheet is then placed over the piece of cloth or paper on which the map is to be made and a workman stencils it with a stiff brush, using liquid coloring—ordinary water colors. This process is continued till all the colors are placed on the map and the lettering put in. It is a cheaper and more expeditious method where few copies are desired and where the size is great, as in very large wall maps. It is not impossible to make these large maps by wax engraving, as the plates can be made in sections, as is often done, and then joined in printing. One such wax map, for a Western railroad, was so intricate and had so many thousands of names upon it, that it took two years to finish.

Putnam Drew.

Mapes, māps, **Victor,** American playwright: b. New York 10 March 1870. He was graduated from Columbia in 1891, was Paris correspondent of the New York *Sun* 1892–6, and dramatic critic of the New York *World* 1898–9. He has written 'Duse and the French' (1897); and among plays by him may be named: 'A Flower of Yeddo' (1898); 'The Tory's Guest' (1900); 'Don Cæsar's Return' (1901).

Maple, a genus (*Acer*) of trees, together with a few shrubs of the order *Sapindaceæ;* or according to some botanists, the type genus of the order *Aceraceæ.* The species, of which there are nearly 100, are indigenous to the North Temperate zone, being most numerously represented in China, Japan, the United States and Canada. They are characterized by opposite, palmate or lobed, exstipulate leaves; small polygamo-dioecious flowers in axillary corymbs or racemes; and compound, one- or two-seeded, long-winged nuts (samaras). The maples constitute one of the most widely useful genera of trees, being extensively employed for ornamental and street planting, for wind-breaks, while the wood serves well for tool-handles, furniture, flooring, and many other purposes. As fuel, they are especially valuable, being considered superior to almost all other woods except hickory. Because of their popularity for ornamental planting a great number of horticultural varieties have been produced, especially in Japan, and nearly all, but particularly the Japanese and American species and varieties, are noted for their brilliant autumnal colorings, which in the various shades of yellow and red are unequaled by any other group of northern trees. The flowers are rich in nectar and are sought by bees. Most of the species thrive best upon rich moist land suitable for agricultural purposes and are considered an indication of the type of soil. A few grow in wet land, and many upon mountain sides. They are readily propagated by means of seeds which, in the case of the early maturing kinds, should be sown as soon as ripe, the later ones in autumn or spring, being stratified in sand during the winter. Some choice varieties are grafted or budded and others may be increased by cuttings and layers.

In America, the best known, most widely planted and otherwise most important species is probably the rock or sugar maple (*A. saccharinum* or *A. saccharum*), a stately round-headed, gray-barked tree often attaining heights of 120 feet. It is especially characteristic of rich woods from Maine to Michigan and southward in the mountains to Georgia, everywhere being noted for the surpassing splendor of its leaves in autumn. Besides great popularity for all the purposes mentioned above, some of its specimens are highly prized for their wavy grained wood, which being of satiny appearance and capable of high polish is used under the name of curly maple often as veneers for choice furniture. It is further the most important of the species which yield a saccharine sap, and is a chief source of maple syrup and sugar, to obtain which the trees are «tapped,» the sap caught in buckets and evaporated. A yield of three pounds annually is considered very profitable; six pounds or even more is often obtained from many specimens whose sap is either especially abundant or particularly rich in sugar. If properly done no injury results to the trees. One of its varieties, the black maple (*A. saccharinum,* var. *nigrum*) so called from the color of its very dark-colored bark, is considered a distinct species (*A. nigrum*) by some botanists. It has the same range and habitats as the preceding and in nearly every respect the same uses, including sugar production. This form is more abundant than the preceding in the Central States.

The silver maple (*A. dasycarpum;* or according to Linnæus, *A. saccharinum*) is a widely spreading tree which attains a height of 120 feet throughout the same range as the above species. Being very ornamental in form and particularly also because of its graceful leaves, which are silvery white beneath, this tree is widely planted where rapid growth and quick effects are desired. Its chief fault is its brittleness; it quickly succumbs to high winds. It will succeed upon a wide variety of soils. Its sap, though rather sweet, is less useful for sugar than the above mentioned species.

The red, scarlet or swamp maple (*A. rubrum*) attains heights similar to the above, has about the same range, but is most frequently found in wet ground. It is named from the brilliant color of its flowers, which are borne profusely in early spring before the leaves appear and its red fruits which appear soon after. Being of good habit it is widely planted for ornamental purposes upon all kinds of soils. Its wood is used for most of the purposes enumerated above.

The Norway maple (*A. platanoides*) is somewhat smaller than the preceding species, being more compact and umbrageous. It is widely planted in private grounds and in parks, but is less valuable for street planting than the above because of its shorter trunk. It is a native of

Europe. The sycamore maple (*A. pseudo-platanus*) another European species is smaller still, attaining only about 70 feet. It is also widely planted in America as well as in Europe, being a vigorous, rapid grower and succeeding upon a great variety of soils. The common maple (*A. campestre*) occasionally attains 50 feet, but is usually a smaller tree or even a shrub. It is of European origin and is widely planted.

The Japanese maples (*A. japonicum* and *A. palmatum*) are both small trees or shrubs which because of the great diversity of form of their leaves, and their dainty habit have become widely popular in the parks and gardens of the United States and Europe. Their exceptionally brilliant autumnal coloring is taken advantage of in Japan where in the fall they approach the chrysanthemum in popularity.

There are many other species but these are the most important. Another group, the ash-leaved maples, are generally grouped under the generic name *Negundo*. The best known representative is the box-elder (*A. negundo* or *Negundo aceroides*), which is widely planted in the Western States for wind-breaks and shelter belts and for fuel.

The maples furnish food for a large number of insects, some of which live upon the green parts, and others upon the wood. Several species of scale insects (q.v.) are often abundant enough to do considerable damage.. The cottony maple scale (*Pulvinaria innumerabilis*), *Pseudococcus aceris*, a European insect, and the «gloomy» scale (*Aspidiotus tenebricosus*), a southern species, are among the most troublesome. Several caterpillars live upon the leaves, the forest tent caterpillar (*Malacosoma disstria*), the fall web-worm (*Hyphantria cunea*), and the larvæ of the tussock moth (*Orgyia leucostigma*), being the most generally important. The maple worm (*Anisota rubicunda*) is frequently very destructive. It is the larva of a moth. Of the borers, the larvæ of *Dicerca divericata*, and *Glycobius speciosus*, which are beetles in the adult state, and those of *Ægeria acerni*, a clear winged moth, are among the best known. The second beetle mentioned is known as the sugar maple borer. Consult: ‘Bailey, Cyclopedia of American Horticulture,’ New York (1900–2).

Maple Sugar Industry, a trade term, in common use, pertaining to the manufacture of sugar and syrup from the sap of rock or sugar maple, *Acer saccharinum*. This production is classed under «Agriculture» by the United States Census Bureau, and note was made of its importance at a very early day in the history of the government. The product is strictly confined to North America, and the greater part to more or less limited areas in each of the geographical divisions known as New England, the Middle and Central-Western States, and Canada bordering on the North. Twenty-three States reported maple sugar or syrup in 1900. Of the 11,928,770 pounds of sugar made that year in the United States, 87.8 per cent, or 10,478,240, were produced in the North Atlantic States. The three States of Vermont, New York, and Pennsylvania reported over 80 per cent of the total. On the other hand, the States of the North Central division were credited in 1900, with 1,211,334 gallons of syrup, out of a total of 2,056,611 for the entire country. In this division the great maple sugar producing States
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Production and Adulteration.— The demand, in the United States, being many times in excess of the natural production, maple sugar and syrup must be considered a luxury. This fact has led to the «manufacture» of an article of commerce in which the pure maple product plays a very inconsequential part. Good authorities assert that sugar refiners make much more sugar and syrup, labeling it «maple,» than the entire natural production; that the refuse sugar of the real maple enters into the artificial combination of glucose, cane or beet sugar, and chemicals,— to a very large degree creating a ready market for black American and Canadian sugars, and the «late runs» of the maple sugar-producing sections of both countries.

Maple Sugar Makers' Associations.— In the more important States, organizations have been formed for the mutual protection of common interests. These associations comprise in their membership the larger producers of maple sugar, and not infrequently, include State officials and their respective delegations in Congress. Influenced by these representatives of material interests to State and Nation, the United States government, through its Department of Forestry, has instituted a series of experiments for the purpose of fostering the maple sugar industry of the United States; to devise means for a more successful propagation of the sugar maple, and to enhance the quantity, quality, and value of the «orchards» now in existence.

H. L. Stillson.

Mapleson, mā'pl-sȯn, **James Henry,** English operatic impresario: b. London 4 May 1830; d. there 14 Nov. 1901. He was educated at the Royal Academy of Music, London, and went to Italy for vocal instruction, but was compelled to abandon his career as a singer, owing to throat trouble. He then entered an orchestra, playing the viola and in 1861 he became manager of the Lyceum Theatre. In 1862 he assumed the management of Her Majesty's Theatre where he made himself famous. In 1871, after the burning of Her Majesty's Theatre he managed Drury Lane but returned to the new Her Majesty's upon its completion. In 1878 he conducted the tour of an Italian opera in America and subsequently made tours with the greatest singers of the day, including Patti, Nilsson, etc.

Mapurito, mä-poo-rē'tō, one of the Mexican white-backed skunks. See Skunk.

Maqui, mä'kwē, an evergreen shrub of the linden family found in Chile, from the juice of whose acid fruit the Chileans make a wine given to persons ill with a fever. Its wood is employed in making musical instruments, and its bark furnishes strings for them. It is the best-known species of the genus *Aristotelia* (*A. maqui*), and is cultivated as an ornamental shrub in Europe.

Maquoketa, mạ-kō'kē-tạ, Iowa, city, county-seat of Jackson County; on the Maquoketa River, and on the Chicago, M. & St. P. and the Chicago & N. W. R.R.'s; about 40 miles northwest of Clinton and 30 miles south of Dubuque. It is in an agricultural section; valuable limestone quarries are in the vicinity, and not far distant are forests which furnish excellent hardwood timber. Its chief manufactures are flour, lime woolen goods, brick, tile, foundry and machine-shop products, and wooden-ware. It has an extensive trade in manufactured articles, farm products and live-stock. It has county buildings, several churches and schools, and the Boardman Library Institute. The city owns and operates the water-works. Pop. (1900) 3,777.

Mara, mä'rạ, in old Runic, a goblin that seized on men asleep in their beds, and took from them all speech and motion. In Russian it was called *kiki-mora,* or ghost. Mara is another representation of incubus or nightmare (qq.v.).

Marabou, măr-ạ-boo', a large African pink-white pouched stork (*Leptoptilus crumenifer*), which resembles the adjutant (q.v.) of India in appearance and habits. It gives its name to the soft and drooping feathers (coverts) which cover the root of the tail and are prized for millinery and other ornamental purposes; a large part of the «Marabou feathers» sold, however, are derived from the Indian adjutant.

Marabouts, măr'ạ-boots, **Maraboots,** or **Marabuts,** an Arab tribe of religious devotees, saints or sorcerers, who are held in high estimation, and who exercise in some villages a despotic authority. They distribute amulets, affect to work miracles, and are thought to exercise the gift of prophecy. Throughout the Barbary States the tombs of the Marabouts are conspicuous objects, being generally built in the open country, and regarded by the people with much reverence. The living Marabouts are regarded by foreigners as little better than vagabonds.

Maracaibo, mä-rä-kī'bō, Venezuela, capital of the state of Zulia; situated on the western shore of Lake Maracaibo; has a large and safe harbor; and maintains commercial relations with foreign markets, with the interior, and with Colombia. The Red «D» Line Steamship Company, of New York, sends a vessel on regular trips to Maracaibo, and hundreds of small craft, suitable for shallow waters, carry on the trade of the coast and rivers tributary to the lake. This city is also the starting point for passenger and freight steamers and the railway lines of sections of the state of Los Andes. The most important buildings are the Executive Mansion, the public market, Legislative Palace, Municipal Building, Baralt Theatre, University, six churches, and the new jail. There are 5 hotels, 2 clubs, 24 restaurants, etc. The public plazas contain statues of the patriot, Gen. Rafael Urdaneta, and Don Rafael Baralt, author of a history of Venezuela, who was born in Maracaibo and became a member of the Royal Spanish Academy. There is a dockyard for the construction of sailing-vessels, and the city has electric lighting, telegraph and telephone service, submarine cable, street railways, etc. In 1901, its exports were: coffee, 25,626,000 kilos; cocoa, 154,000 kilos; hides, 456,000 kilos; deer and goat skins, 147 tons; copaiba, 41 tons; fustic, 6,272 tons; dividivi, 3,368 tons; brown sugar, 283 tons; fish sounds, 36 tons. The number of vessels entering this port in the year just mentioned was 431. Maracaibo, at first called Nueva Zamora, was founded in 1571 by Alonzo de Pacheco. The population in 1899 numbered more than 35,000.

Maracaibo, Gulf of. See VENEZUELA, GULF OF.

Maracaibo, Lake of, Venezuela, in the northwestern part, connected with the Gulf of Venezuela by a strait about 50 miles long and from 8 to 15 miles wide. The lake is about 100 miles long and 80 miles across the widest part. At the mouth it is about 500 feet deep, but at its head it is shallow and the land near the shore is marshy. Large vessels cannot enter because of a bar at its mouth which leaves only from 8 to 13 feet of water. A number of rivers flow into the lake and keep it fresh, but when strong north winds prevail it becomes brackish. The tides do not affect the lake to any very great extent although it is a marine inlet. It was once much larger than at present, as the shore-marks indicate, but the basin has been filled in leaving this one large lake and a number of smaller lakes which are connected by creeks. See also VENEZUELA.

Marajo, mä-rä-zhō′, Brazil, an island at the mouths of the Amazon and Para rivers; area, about 18,000 square miles. The greater part is low, in the centre are several lakes. In the north and west are swamp lands and in the east and south forests, the rubber tree predominating. The chief settlement is Sauré on the eastern coast. There are not many residents, as in the rainy season nearly the whole island is flooded. Cattle raising and gathering rubber are the chief occupations.

Maral, the red deer of Persia.

Maranham′, mä-rän-yäṅ, or **Maranhão,** Brazil, a maritime state, bounded on the north by the Atlantic Ocean; area, 177,566 square miles. The surface is uneven, but there is no range of mountains. There are numerous rivers flowing into the Atlantic, large forests, extensive plains where cattle are reared; the climate is fine, and the soil fertile. Paranahyba is the principal river. Agriculture, however, has not prospered here, and the emancipation of the slaves, on whose labor the state had depended, was followed by a period of great depression. Cotton, sugar, and rubber are the principal products. Coffee, rice, corn, cacao, and tropical fruits grow luxuriantly. The population is not great enough to properly develop the rich natural resources. Efforts are being made to colonize different sections. The present inhabitants are chiefly of Portuguese descent; but there are about 20,000 Indians and a few hundred negroes and mulattoes. The capital is Maranham. Pop. (1900) 450,762.

Maranham, or **São Luiz De Maranhão,** säṅ loo-ēzh′ dō mä-rän-yäṅ′, Brazil, capital of the State of Maranham; on an island on the bay of São Marcos, and between the mouths of the Itapicurú and Mearim rivers. The first settlements were made by the French in 1612. The ground is low and the climate warm but the place is healthful. The harbor, once good, is filling with sand, and little or nothing is done for its improvement. It has considerable trade; the chief exports are cotton, sugar, hides, rubber, cotton-seed, and the skins of goats. The chief imports are cloths and clothing. The city has many fine buildi
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Maratti, mä-rät'tē, or **Maratta,** mä-rät'tä, **Carlo,** Italian painter and engraver: b. Camerino 13 May 1625; d. Rome 15 Dec. 1713. While a child he amused himself with painting all sorts of figures drawn by himself on the walls of his father's house. In his 11th year he went to Rome, studied the works of Raphael, of the Caracci, and of Guido Reni, in the school of Sacchi, and formed himself on their manner. His Madonnas were particularly admired. Louis XIV. employed him to paint his celebrated picture of Daphne. Clement IX., whose portrait he painted, appointed him overseer of the Vatican gallery. We are much indebted to him for the preservation of the works of Raphael in the Vatican, and of the Caracci in the Farnese Palace. He also erected monuments to those masters in the church della Rotonda. As an artist Maratti deserves the title given him by Richardson, of the «Last Painter of the Roman School.»

Maratti'ales. See FERNS AND FERN-ALLIES.

Maravedi, măr-ạ-vā'dĭ, a name given to old Spanish copper coins in use from 1474 to 1848, varying in value from 1-7 to 1-3 of a cent. There were also, at an earlier period, maravedis of gold weighing 60 grains.

Marbeau, Jean Baptiste Firmin, zhŏṅ bä-tēst fēr-măṅ mär-bō, French philanthropist, founder of the day-nursery: b. Brives 18 May 1798; d. St. Cloud 10 Oct. 1875. He practised law in Paris, and in 1841, being deputed to inspect the charitable institutions of the first arrondissement of the city, planned the crèche or day-nursery for the care of children of working mothers. The first crèche was opened 14 Nov. 1844 at Chaillot; a Société des Crèches was founded in 1846; and his plan was described in his book, 'Des Crèches' (1845). Marbeau played a less prominent part in other charities and wrote on various problems of pauperism. Consult the life by Roussel (1875).

Mar'ble, mär'bl, **Manton,** American journalist: b. Worcester, Mass., 16 Nov. 1835. He was graduated from the University of Rochester in 1855 and engaged in journalism in Boston where he was on the staff of the *Journal* and later on that of the *Traveller.* In 1858 he went to New York and was on the editorial staff of the *Evening Post* and in 1862–76 was owner and editor of the *World.* He was a member of the Bimetallic Congress in Europe in 1885 and is the author of 'A Secret Chapter of Political History' (1878).

Marble (from the Greek *marmairein,* to sparkle), a compact rock which, in its pure form, is composed entirely of carbonate of lime or limestone. In its best form it is a variety of calcite, the tiny crystal facets sparkling and flashing in the sun's rays; hence its ancient name. It is seldom found in perfect purity, the tractable qualities of the limestone allowing the introduction of many foreign substances during its formation. Thus there will be seen marble with streaks of various colors running through it, caused by the action of oxide of iron or other chemicals. Almost any limestone rock is commonly called marble, even certain varieties of granite, onyx, porphyry and rock largely composed of gneiss and mica-schist.

Marble has been a favorite stone for forming into statuary and for decorative work in buildings and monuments, from the very earliest ages. The Greeks, who were the first to endow this lifeless stone with marvelous genius in their statuary and bas-reliefs, were blessed with an almost inexhaustible supply of the very finest and purest marble yet discovered, on the island of Paros, in the Ægean Sea. This marble, so celebrated as «Parian,» possesses a peculiar waxy attribute which gave the statues formed from it a beautiful polish. The 'Venus de Medici' was made from this stone, which is almost perfectly white. The Parthenon was built of marble of Pentelicus, which was a little more finely grained. The marbles of Carrara were even then known but not generally put in use till later years, being still among the finest marble in the world, though having some gray streaks.

In many other parts of Continental Europe and in Great Britain are quarries of fairly pure marble. In America, however, will eventually be found the finest supply of this useful stone in the world. Each year new juttings of it are found in wild parts of the Rocky Mountains, some of them pure white, while others are limned with variegated colorings, rivaling a rainbow in brilliancy. Perhaps the finest example of these wonderful marbles of the Rockies is found in the new State Capitol building of Colorado, at Denver. The geologists of that State have been unusually energetic in discovering useful minerals in their mountains and have incorporated in the Capitol many of them. Walls, exterior and interior, are composed of richly grained granites and marbles, more beautiful and rare than any even dreamed of by the ancients. In the same slab of stone can often be seen a variegation of lines and hues, ranging from the purest white, with sparkling granular crystals of calcite, to delicate grays, limpid blues, vivid reds and velvety onyx. To reproduce this celebrated structure in any other part of the world would be a labor almost impossible of accomplishment and infinitely costly. In the eastern part of the United States there are many quarries of marble which have been in use for many years. Vermont is probably the seat of the largest quarries. Little of this marble is finely grained and white enough to answer for the sculptor's use, but it is admirably adapted for ornamental purposes in architecture and for monuments for the dead. American sculptors still generally use the marbles from Carrara, though the merits of the American product are becoming known. Vermont, although one of the smallest States in the Union, exports more stone for commercial purposes than any other State, except one, Pennsylvania standing first. The money value in 1903 of Vermont's stone product was in excess of $6,000,000, a large part of it being in marbles of various grades.

The quarrying of marble is now carried on extensively, the use of machinery largely taking the place of the ancient hand methods. Fifty years ago the quarries of Rutland, Vt., still the largest in the world, were operated by ox teams, and hand work of the crudest form. Today, these vast quarries have an extensive outfit of electric cranes and derricks, which move the blocks of marble in any desired direction, easily and quickly, one of these traveling cranes having a carrying capacity for 100,000 pounds. The stone is too easily broken to permit the use of blasting powders of any kind. This method is used in some of the Italian quarries, but causes great waste of material and is most unsatisfactory. In the Vermont quarries, a machine called a "channeler" has been found the best for economical work, and has been exclusively adopted for about ten years. It consists of a row of long chisels set in a strong, traveling framework. This gang of chisels vibrate up and down, cutting a channel in any direction desired in the face of the marble ledge. The channel can be made any reasonable depth, according to the size of block desired. When this channel, or groove, is sufficiently long and deep, the machine is reversed and cross channels are cut and the bottom perforated. Then wedges are carefully driven in behind the block of stone and it gently falls over, to be lifted by a crane to the railroad cars or to that part of the quarry devoted to further treatment of the output. As a rule, the stone is sent in its rough state to the purchaser, who dresses it himself. When the order is for monument work or some special design in architecture, the marble is treated at or near the quarry. In thus further treating the product, a toothless saw, or gang of saws, is used. The block of stone is placed on a horse, or platform, and the saws set at work, the size of the cut being gauged by setting the saws close together, or far apart, as needed. A stream of water in which is mixed sea sand or other sharp, hard sand, falls upon each saw. The friction of the iron blade, aided by the sand and water, quickly cuts up the marble into any desired shape. Some marble cutters use saws of wire, but the best seem to be those made of strips of soft iron one sixteenth of an inch thick and, when new, four inches wide. The marble wears down one of the saw blades very rapidly. When the blocks are thus sawn into the requisite shapes by the power gang-saws, they are then placed on tables and ground down to size, a small piece of marble being rotated over them by hand or power, water flowing over the surface being ground. With surprising facility, the marble yields to this treatment. Polish, in the final stages, is given by rubbing with wood or other soft material, and finally cloth. Much hand work is, of course, necessary with the mallet and chisel and polisher, but all the rough, heavy work, which formerly made marble so costly and hard to obtain, is now done entirely by electric and steam power. One of the finishing rooms at the Rutland works, located at Proctor, Vt., is 1,000 feet long and contains scores of giant gang saws, cutting up the marble into various shapes. This one plant, the largest in the world, has an output of $3,000,000 annually, and employs hundreds of men. Most of this output is of white marble, though brown, gray, green and other shades are found in profusion.

One ancient method of mining this delicate stone, still used entirely by the Mexicans in mining onyx, is to drill holes in a line, insert plugs of some porous wood, pour in water and allow the wood to swell. This gently forces the precious stone free, without the least injury.

One quality of marble, not usually recalled, is its ability to withstand great heat safely. In the devastating fire in 1903 at Paterson, N. J., buildings built of granite crumbled and perished. Those of marble still stand, almost as good as ever. Its use is therefore becoming more and more general in erecting fireproof buildings in the large cities, the floors and often the entire inside wall and ceiling being overlaid with it.

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flat slab of stone, with a number of concentric furrows upon its face. Over this a block of oak of the same diameter, partially resting upon the small stones, is kept revolving, while water flows upon the stone slab. In 15 minutes the marbles are worn completely round, and are fit for sale. An establishment with three mills will manufacture 60,000 marbles in a week. Agates are made into marbles at Oberstein by first chipping the pieces nearly round with a hammer, and then wearing them down upon the face of large grindstones. The game of marbles is variously played; usually with a circular ring marked on the ground, the player taking one marble between the thumb and forefinger and dexterously shooting at other marbles within the circle, striking them with sufficient force as to throw then outside of the limits of the ring.

Mar'bling, in bookbinding, a process of ornamenting the edges of books. After the edges of the book have been cut by the plough (see Bookbinding) the book is tied between two boards and taken to the trough, a vessel 2 inches deep, which is filled with clean gum water. Various colored pigments, ground in spirits of wine and mixed with a small quantity of ox gall, are thrown upon the surface of the gum water, and disposed in various forms with a quill and comb, according to the required pattern. This being obtained, the edges of the book are dipped into the trough, and the colors adhere. Cold water is then dashed over the edges, which sets the colors and brings them out clear.

Marburg, mär'boorg, Prussia, a town of Hesse-Nassau, on the slopes of an acclivity above the Lahn, 46 miles north of Frankfort, 60 miles by rail via Cassel. The principal buildings are the castle of the landgraves of Hesse, now partly used as a prison; the 13th century church of St. Elizabeth; the town-house and the celebrated university, the first founded in Germany after the Reformation, and having in 1900, 93 professors and 1,184 students. The town has manufactures of machinery, leather, pottery and toys. Pop. (1900) 17,527.

Mar'bury v. Madison, a well-known decision in law handed down in 1803 by the United States Supreme Court. It is important as affording the earliest instance of the declaration by the Court that a Congressional statute is null and void by reason of its repugnance to the Constitution of the United States. Marbury was appointed justice of the peace in the District of Columbia by President Adams, but the commission, though drawn up, signed, and sealed, had never been delivered. Madison, when he became secretary of state, refused to deliver it. An act of Congress empowered the United States Supreme Court to issue to executive officers a writ of mandamus to force them to attend to their duties, and on the basis of this act Marbury brought suit. Now the Constitution nowhere mentions the right to issue a writ of mandamus among the cases of original jurisdiction by the Supreme Court. Chief-Justice Marshall therefore decided against Marbury, and his argument, admittedly the only accurate one, established an important precedent which is found only in the courts of the United States.

Mar'casite, in mineralogy, a bisulphide of iron. The term includes several varieties of iron pyrites, which have been named after the form they present: namely, cellular pyrites, cockscomb pyrites, hepatic pyrites, or leberkies, etc. It is used in the manufacture of sulphur, sulphuric acid, and sulphate of iron.

Marcel, Etienne, ā-tē-ĕn mär-sĕl, French political leader: d. Paris 31 July 1358. From December 1355 he was provost of the Paris merchants and actual ruler of the city. He put to death two officials of the crown, and finally persuaded the Dauphin Charles to act as regent while King John was held by the English. Not finding the Dauphin properly submissive, he obtained assistance from Charles the Bad of Navarre. He was killed during an uprising of the more wealthy and conservative citizens against his power. Consult Lazard, ‘Un Bourgeois de Paris au XIV. Siècle’ (1890).

Marcellinus, mär-sĕ-lī'nŭs, **Saint:** d. 25 Oct. 305. He was a pope who succeeded Caius in 296. The Donatists alleged that during the Diocletian persecution he sacrificed to idols. He was, however, vindicated by Augustine from this charge.

Marcellus, mär-sĕl'ŭs, **Marcus Claudius,** Roman general: b. before 268 B.C.; d. near Venusia, 208 B.C. In 222 being consul with Scipio he twice defeated the Insubrians in northern Italy, and with his own hand killed their king, thus winning the *spolia opima*. After the disaster of Cannæ in the Second Punic War (216), Marcellus took command, gained several slight victories over the Carthaginians, and hence was named «the sword of Rome,» Fabius Cunctator being called «the shield of Rome.» His third consulship (214) was spent in Sicily, where he attacked Syracuse, and after a two years' siege prolonged by the skill of Archimedes captured the city. In his fifth consulate after two years of varying success against Hannibal in Italy he was killed in a skirmish near Venusia.

Marcellus I., Saint, pope: d. 310. He succeeded Marcellinus in 304. The Emperor Maxentius banished him from Rome for excommunicating an apostate, and according to some authorities forced him to serve as a slave in the imperial stables. He suffered martyrdom under Maxentius.

Marcellus II. (Marcello Cervini, mär-chĕl'lo chĕr-vē'nē), pope: d. 1 May 1555. He was cardinal legate at Trent of Julius III., whom he succeeded in the pontifical chair. Although originally opposed to polyphonic music, he at once withdrew his opposition to it after listening to Palestrina's famous ‘Missa Papæ Marcelli.’ His pontificate lasted only 22 days.

Marcellus Stage, in geology, a term introduced by the New York State Geological Survey for the thin rock mostly shale, which is the lowest group of the Upper Devonian System, and which is most typically seen in New York State at the little village of Marcellus, whence the stage is named.

March, Francis Andrew, American philologist: b. Millbury, Mass., 25 Oct. 1825. He was graduated from Amherst in 1845, studied law in New York in 1849–50, was admitted to the bar in 1850, in 1856 became adjunct professor of belles-lettres and English literature in Lafayette College (Easton, Pa.), and in 1857 professor there of the English language and comparative philology. In 1873–4 and 1895–6 he was president of the American Philological Association, in 1876–1903 of the Spelling Reform Association and in 1891–3 of the Modern Language Association. He was among the earliest advocates of a historical study of the English language, and of a philological study of the classic works of that language. His contributions to the transactions and proceedings of the American Philological Association and other learned societies have been very extensive. He also edited the Douglass series of Christian Greek and Latin classics (1874–6), was director of the American readers for the great 'Historical Dictionary of English' of the London Philological Society, and published: 'A Method of Philological Study of the English Language' (1865); 'Parser and Analyzer for Beginners' (1869); an 'Anglo-Saxon Grammar' (1870); an 'Anglo-Saxon Reader' (1870); and an 'Introduction to Anglo-Saxon' (1871).

March, märH, Austria-Hungary, the principal river of Moravia, rising on the Silesian boundary, and flowing 214 miles southward to the Danube, which it joins six miles above Presburg. It is navigable for small boats from Göding, 50 miles from its mouth. In its lower course it forms the boundary between Austria and Hungary. Its chief affluent is the Thaya.

March, in Europe, a frontier or boundary of a territory; especially applied to the boundaries or confines of political divisions; as, for example, the frontiers between England and Scotland, and England and Wales. Geneva is situated in the Marches of France, Savoy and Switzerland.

March (Latin, *Martius*), (1) the third month of the year, originally the first of the Roman year; so named in honor of the Roman deity Mars. Prior to 1752 the 25th of March was the first day of the legal year; hence, January, February, and the first 24 days of March have frequently two years appended, as January 1, 170½ or 1701–2. (See CALENDAR.) (2) A movement by regular steps in the manner of soldiers; also a journey performed by a body of soldiers either on foot or on horseback. Soldiers on a march are subject to certain rules very necessary to keep them in good order, and fit to meet the enemy. The march in the first sense of regular step differs on different occasions. In the parade-march from 75 to 95 steps, each of about 30 inches, differing in different armies, are made in a minute; in the quick-march from 108 to 115 steps; and in the double quick 150 running paces. This last cannot be sustained for any length of time, and is only used in a charge, or in storming a commanding position, and in a few internal movements of regiments. (3) A musical composition, chiefly for military bands, with wind instruments, intended to accompany the marching of troops. There are slow and quick marches, and marches peculiar to different countries. Marches are also introduced into oratorios, the best-known examples being the 'Dead March' from the oratorio of 'Saul' and Mendelssohn's 'Wedding March.' See MUSIC.

March Flies, small, hairy, scavenging flies of the family *Bibionidæ,* seen numerously in early spring, often before the snow has disappeared. The species are over 300, and some appear in vast swarms. The maggots hatch in refuse or manure upon the ground, and are believed to feed upon grass-roots.

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telegraphed Sherman from City Point as follows: «As soon as your men are properly rested, and preparations can be made, it is desirable that another campaign should be commenced. We want to keep the enemy continually pressed to the end of the war. If we give him no peace while the war lasts, the end can not be far distant. Now that we have all of Mobile Bay that is valuable, I do not know, but it will be the best move for Major-General Canby's troops to act upon Savannah, while you move on Augusta. I should like to hear from you, however, on this matter.»

To this Sherman telegraphed in reply: «If you can manage to take the Savannah River as high as Augusta, or the Chattahoochee as far up as Columbus, I can sweep the whole State of Georgia, otherwise I would risk our whole army by going too far from Atlanta.»

In a letter from Atlanta, dated 20 September, Sherman gave Grant the conditions under which he could successfully co-operate in a movement on Savannah: «If you will secure Wilmington and the city of Savannah from your centre, and let General Canby have command over the Mississippi River and the country west of it, I will send a force to the Alabama and Appalachicola, provided you give me 100,000 of the drafted men to fill up my old regiments; and if you will fix a day to be in Savannah I will insure our possession of Macon and a point on the river below Augusta.»

Gen. Grant thereupon conferred by letter with Gen. Halleck in regard to establishing a base on the coast for Gen. Sherman and providing supplies, giving his own opinion that Savannah could be captured by troops from the east assisted by those in the Department of the South, and that the line of Augusta and Savannah would be a better one than Montgomery, Selma, and Mobile. Grant further said in this letter 4 October: «Whichever way Sherman moves he will undoubtedly encounter Hood's army, and in crossing to the sea-coast will sever the connection between Lee's army and his section of the country.»

Gen. Sherman fixes the day after his letter of 20 September as the date when his plan of a march to the sea came first into his mind. It differed from Grant's plan based upon first disposing of Hood's army, in that it involved leaving Hood in his rear, to be taken care of by Thomas, and marching through to Savannah with no enemy in his front. Upon this plan a discussion arose with Grant, who for some time held to the necessity of first dealing with Hood. This discussion between Grant and Sherman lasted for several weeks. While it was in progress Hood became active. On 20 September Forrest's cavalry began vigorous operations about Athens and Decatur, Ala., and Pulaski, Tenn. Sherman at once sent troops to Chattanooga, and 28 September Gen. Thomas was ordered to proceed to Nashville to organize a force to meet a possible northward move of Hood. The first attempt of the latter was to break Sherman's communications by heavy movements upon his railroad. These met with only temporary success, as Sherman promptly pursued. The fighting at Allatoona 5 October was the most prominent affair. Hood then moved to the westward, and occupied Gadsden, Ala. Sherman again followed as far as Gaylesville. Sherman, 10 October, again proposed to Grant to leave Hood and march to the sea. Grant replied the same day. «If you are satisfied the trip to the sea-coast can be made, holding the line of the Tennessee firmly, you may make it, destroying all the railroads south of Dalton or Chattanooga as you think best.» This condition of firmly holding the line of the Tennessee held Sherman for a time. Although this conditional permission had been given by Grant, he telegraphed Sherman 1 Nov.: «Do you not think it advisable, now that Hood has gone so far north, to entirely settle with him before starting on your proposed campaign? With Hood's army destroyed you can go where you please with impunity.» Sherman learned, 26 October, that Hood's army had appeared about Decatur. This clearly indicated an invasion of Tennessee. Gen. Sherman then decided to strengthen Gen. Thomas, leave him to take care of Hood, withdraw his own army to Atlanta, and prepare for a march to the sea provided Gen. Grant's consent could finally be obtained. He sent the Fourth and the Twenty-third corps back to Thomas. Thus the discussion with Grant over the question of first destroying Hood continued until 1 November, when, in response to a later telegram on that day from Sherman, which represented that Hood's whole force was only from 37,000 to 40,000, while Thomas would have from 63,000 to 70,000, and that he himself had retained only 50,000 men for his proposed campaign to the coast, Gen. Grant telegraphed, «With the force, however, that you have left with Gen. Thomas, he must be able to take care of Hood and destroy him. I really do not see that you can withdraw from where you are, without giving up all that we have gained in territory. I say then go on as you propose.»

Having obtained this permission Sherman pushed his preparations with the greatest energy. The entire population of Atlanta had already been deported; the various divisions of the army designed for the march were ordered to concentrate at Atlanta; all mills and factories at Rome were burned; the surplus stores, the sick, convalescent, and many thousands whose terms of service were about to expire were rushed to Chattanooga; the garrisons south of that place were withdrawn, and the railroad destroyed. Every command was carefully inspected, and soldiers found in any degree physically unsound were despatched to Nashville. Care was taken that every man's accoutrements were complete. In the same way the horses, mules, and trains were inspected. Wilson's cavalry was dismounted to make Kilpatrick's division perfect, and the remnants sent with Wilson to Nashville.

The march to the sea began on the morning of 15 November. As Gen. Sherman wrote: «It surely was a strange event — two armies marching in opposite directions, each in the full belief that it was achieving a final and conclusive result in a great war;—» Hood's army, which had required the active work of three armies from May until September to push it back to Atlanta, had crossed the Tennessee at Decatur, strengthened by Forrest's cavalry and aiming for Nashville and the Ohio River. The situation at Nashville was thus described by Sherman: «General Thomas was at Nashville, with Wilson's dismounted cavalry and a mass of new troops and quartermaster's employees amply sufficient to defend the place. The Fourth and Twenty-third corps, under Generals Stanley and Schofield, were posted at Pulaski, Tennessee, and the cavalry of Hatch, Croxton, and Capron, were about Florence, watching Hood. Smith's (A. J.) two divisions of the Sixteenth corps were still in Missouri, but were reported as ready to embark at Lexington for the Cumberland River and Nashville. Of course, General Thomas saw that on him would likely fall the real blow, and was naturally anxious."

Sherman started with 62,204 officers and men. Of his army he wrote: "The most extraordinary efforts had been made to purge this army of non-combatants and of sick men, for we knew well that there was to be no place of safety save with the army itself; our wagons were loaded with ammunition, provisions, and forage, and we could ill afford to haul even sick men in the ambulances, so that all on this exhibit may be assumed to have been able-bodied, experienced soldiers, well armed, well equipped and provided, as far as human foresight could, with all the essentials of life, strength, and vigorous action."

The artillery, wagon, and ambulance trains were perfect. Each gun, caisson, and forge was drawn by eight horses. There were 2,500 wagons with six mules to each, and the ambulances each had two horses. Each soldier carried 40 rounds, and in the ammunition wagons were 200 rounds for men and artillery.

The right wing, Gen. O. O. Howard, was composed of the Fifteenth and Seventeenth corps; the left wing, Gen. H. W. Slocum, of the Fourteenth and the Twentieth.

The war had not produced a more thoroughly organized and equipped army, or one in which more men had passed a thorough physical inspection. As it started for the sea, Gen. Sherman in his 'Memoirs' thus describes the feelings of the men, and his own: "There was a devil-may-care feeling pervading officers and men, that made me feel the full load of responsibility, for success would be accepted as a matter of course, whereas, should we fail, this 'march' would be adjudged the wild adventure of a crazy fool." This question was to be decided at Nashville, as Gen. Sherman wrote the day after he entered Savannah: "Thomas' complete success is necessary to vindicate my plans for this campaign—" The march to the sea cannot, therefore, be fully understood without considering the Nashville campaign as one of its essential parts. See NASHVILLE, CAMPAIGN AND BATTLE OF.

Sherman's army was composed of 55,329 infantry, 5,063 cavalry, and 1,812 artillery. There were two corps, 13 infantry divisions, one cavalry division, 36 brigades of infantry, two of cavalry, and 16 batteries. There was no Confederate army between Atlanta and Savannah. Wheeler's cavalry was active on the flanks guarded by Kilpatrick's cavalry, and a considerable force of militia was encountered at Griswoldville.

The order for this historic march clearly presents its organization, its order of daily movement, its methods of living upon the country, the restrictions placed on its dealings with citizens, in short, the whole military machinery of the campaign. It therefore deserves a place in every history of the March to the Sea, Gen. Sherman himself holding that no account of that event could be
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threatening language, and may, where the officer in command thinks proper, give written certificates of the facts, but no receipts; and they will endeavor to leave with each family a reasonable portion for their maintenance.

7. Negroes who are able-bodied and can be of service to the several columns may be taken along; but each army commander will bear in mind that the question of supplies is a very important one, and that his first duty is to see to those who bear arms.

8. The organization, at once, of a good pioneer battalion for each army corps, composed if possible of negroes, should be attended to. This battalion should follow the advance-guard, repair roads and double them if possible, so that the columns will not be delayed after reaching bad places. Also, army commanders should practise the habit of giving the artillery and wagons the road, marching their troops on one side, and instruct their troops to assist wagons at steep hills or bad crossings of streams.

9. Captain O. M. Poe, chief-engineer, will assign to each wing of the army a pontoon-train, fully equipped and organized; and the commanders thereof will see to their being properly protected at all times.

By order of Major-General W. T. Sherman,
L. M. Dayton, Aide-de-Camp.

Leaving Atlanta in ruins, 15 November, the left wing, which Gen. Sherman accompanied, marched by Decatur, Stone Mountain, and Covington. At this point it turned toward Milledgeville, the capital of Georgia, which was the first objective. It was reached on the 22d. Meantime the right wing had marched by Jonesboro, McDonough, and Monticello, and was in communication with Sherman at Gordon. Kilpatrick's cavalry, which was operating on the right of the advance, kept in contact with Wheeler's cavalry, and reached the defenses of Macon, thence retiring to Griswoldville, where Walcutt's brigade of Wood's division was halted as a rear-guard. Gen. G. W. Smith attacked Walcutt, but was repulsed (see GRISWOLDVILLE, BATTLE OF). Gov. Brown, the State officers, and members of the legislature left the capital on Sherman's approach. The arsenal and various public buildings were destroyed.

The march was resumed 24 November, with Millen as the next objective. The two wings followed the general line of the railroad. Millen was reached 3 December. From Millen the army proceeded by the four main roads for Savannah. The effort of the Confederate authorities to organize a force at Augusta to attack Sherman in flank failed, and the march to Savannah was only slightly disturbed by the persistent skirmishing of Wheeler's cavalry. McLaw's division of Hardee's force had advanced to Ogeechee Church, but fell back to the city upon Sherman's approach. The several corps reached the defenses of Savannah 9 and 10 December, and occupied a line from the Ogeechee River on the right to the Savannah River on the left. Hardee occupied the city with something less than 10,000 men. Sherman's effective force numbered a little over 60,000. Hood held the Savannah River below Sherman's lines.

The march had cut a swath of many miles in width through the richest part of Georgia. The heads of the columns and the flanks swarmed with foraging parties, and a country which was daily scoured to supply food for a marching column of 60,000 soldiers was of necessity stripped of provisions, and of everything else that could contribute to the use or comfort of an army. Railroads had been destroyed for long distances, and all factories and other buildings burned which could contribute to army purposes. There had been no fighting worth mentioning, Griswoldville excepted, and that had only involved one Union brigade.

Gen. Sherman had left Atlanta with 62,204 officers and men of all arms. He reached Savannah with 60,057. On the march 103 were killed, 428 wounded, 278 missing, and 1,338 captured. Of those captured, a large proportion were foragers, better known in army vernacular as «bummers.»

The night of 12 December a bridge had been completed over the Ogeechee, and the next morning Hazen's division crossed and marched at once to assault Fort McAllister (q.v.) and open the way to the sea. An hour before sunset the assault was delivered and the fort taken. This success gave Sherman communication with the fleet which was awaiting him with supplies, and mails for the army.

Gen. Slocum, upon establishing his flank on the Savannah River, had captured two steamboats and sent a force to Hutchinson and Argyle Islands just above the city, and sought permission to transfer a corps to the left bank of the river to close Hardee's only line of escape, Gen. Slocum having already sent a brigade under Col. E. A. Carman to the South Carolina shore. Gen. Sherman did not deem this prudent, and as a result Hardee later withdrew his entire force intact and without molestation.

On 17 December Gen. Sherman sent in a flag of truce demanding Hardee's surrender on the ground that he (Sherman) had received guns that could «cast heavy and destructive shot as far as the heart of the city»; that he controlled all avenues by which the city could be supplied with food; that he would grant liberal terms, but if forced to assault he should «feel justified in resorting to the harshest measures,» and should make little effort to restrain his army.

Gen. Hardee returned a defiant reply, saying he was not shut in, but had free and constant communication with his department. To the specific call for surrender he replied: «Your demand for the surrender of Savannah and its dependent forts is refused.»

Gen. Sherman then proceeded by boat to Gen. Foster's headquarters at Hilton Head to request that a division be sent to occupy the road north of the Savannah River, which line of communication was still open to Hardee. On his return he received the news that during his absence Hardee had put down his bridges and withdrawn with his entire force. The next day Gen. Sherman's forces occupied Savannah.

Bibliography.—‹Memoirs Gen. W. T. Sherman,› Vol. II.; ‹Personal Memoirs Gen. U. S. Grant,› Vol. II. Official Records War of the Rebellion, Vols. XXXII., parts 2 and 3; XXXIX., parts 2 and 3; and XLIV. H. V. BOYNTON.

Marchand, mār-shāñ, **Félix Gabriel**, Canadian legislator and author: *b.* St. John's, P. Q., 9 Jan. 1832. He was educated at St. Hyacinth College, was admitted a notary public in 1855, entered practice at St. John's, and from 1867 sat for the county of St. John's in the legislative assembly of the province of Quebec. From 8 March 1878 to 19 March 1879 he was provincial secretary, from 19 March to 30 Oct. 1879 was commissioner of crown-lands, and from 29 Jan. 1887 to 1892 speaker of the assembly. In 1897 he became premier, with the treasury portfolio. Subsequent to the invasion at Eccles Hill during the Fenian troubles (1870), he commanded a militia brigade. He did much to improve Canadian journalism, and for many years was proprietor and editor of *Le Franco-Canadien*. He published a 'Manuel et Formulaire du Notariat'; and also the comedies 'Fatenville' and 'Erreur n'est pas Compte' in prose, and 'Un Bonheur en Attire un Autre' and 'Les Faux Brillants' in verse.

Marchand, Jean Baptiste Thomas, zhŏṅ bä-tēst tō-mä, French officer and explorer: b. Thoissey 22 Nov. 1863. He attended the military school at St. Maixent, entered the marine service in 1883, was sent to Senegambia in 1889, and in 1890 explored the sources of the Niger. In 1898 he occupied Fashoda, having established a line of posts between French possessions in West Africa and on the eastern coast, but on the demand of England he was forced to withdraw. He took part in the expedition against China in 1900. Consult: Castellani, 'M. l'Africain' (1902); Poirier, 'De l'Oubanghi à Fachoda' (1900).

Marches, The, Italy, a territory now included in the kingdom, but formerly constituting one of the legations of the Papal States. It comprises the region lying between the Apennines and the Adriatic, and is divided into the modern four provinces — Urbino and Pesaro, Ancona, Macerata, and Ascoli Piceno. See ITALY.

Marchesi, mär-kā'sē, **Mathilde,** German singer: b. Frankfort-on-Main, 26 March 1826. Her maiden name was Graumann; she studied under Nicolai in Vienna, and in Paris under Garcia, whose assistant she became. A splendid mezzo soprano she toured Europe for several years, married Salvatore Marchesi, a baritone, in 1852, and in 1854 became professor at the Vienna Conservatory. After three years at Cologne in a like position she removed to Paris in 1868. She was a teacher of rare merit, and author of a method of singing, of two volumes of personal recollections in German (1877; 1888), and of 'Marchesi and Music' (1897).

Marchiali, mär-kē-ä'lē, or **Marchialy.** See IRON MASK, MAN WITH THE.

Marching Through Georgia, a popular ballad sung during the American Civil War, and commemorating Sherman's March to the Sea. It was written by H. C. Work (q.v.) 16 Nov. 1864.

Marcion, mär'shĭ-ŏn, founder of a Gnostic sect, called Marcionites: b. Sinope about the beginning of the 2d century, A.D.; d. about 160. He was a son of the bishop of Sinope, who had become a bishop in his later years, but so much error was mixed with his religious opinions that he was excommunicated by his father. Expecting that his views would meet with a better reception at Rome he set out for that city, but was there a second time excommunicated, 140. He attached himself while there to the Gnostic teacher Cerdo of Antioch, and

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GUGLIELMO MARCONI.

less telegraph that had previously been invented, and to him the scientific triumph of space telegraphy is due. He came to the United States in 1899, there continued his experiments, and in 1900 employed his method in reporting the presidential election of that year. He had already (27 March 1899) sent messages across the English Channel from the vicinity of Boulogne, France, to the South Foreland, England, 32 miles distant. In December 1901 he began his first experiments in transatlantic telegraphy without wires at Signal Hill, at the entrance to the harbor of St. John's, N. F. When his success became apparent through his receiving and plainly distinguishing signals from the Poldhu Station, England, the Anglo-American Cable Company, which holds a monopoly from Newfoundland, compelled him to withdraw, and he selected another station at Table Head, on the east of Glace Bay, Cape Breton Island. On 25-6 Feb. 1902, Marconi, on his way to the United States on board the steamship Philadelphia, received signals at a distance of 2,099 miles and worded messages at a distance of 1,551.5 miles. On 21 Dec. 1902 the first official transatlantic telegrams were sent from Table Head. Marconi later (18 Jan. 1903) sent from the South Wellfleet station, Cape Cod, Mass., direct to Poldhu (3,000 miles), a message from President Roosevelt to King Edward. The Italian government introduced the Marconi system on its warships, and granted an annual subsidy of $200,000. The English government pays royalty for the use of the system on its ships. Thus far (1903), the United States is not committed to the Marconi system, but is impartially testing that and other methods. See WIRELESS TELEGRAPHY.

Marcou, mär-koo', **Jules**, American geologist: b. Salins, France, 20 April 1824; d. Cambridge, Mass., 17 April 1898. He studied at Besançon and the Collége de St. Louis in Paris; devoted himself to geology after several journeys through Switzerland, in which he made the acquaintance of Jules Thurmann, to whom he owed an introduction to Louis Agassiz. In 1846, after taking part in the geological survey of the Jura Mountains he was appointed assistant mineralogist in the Sorbonne; in 1848 having been appointed traveling geologist to the Jardin des Plantes came to America, explored the Lake Superior country together with Agassiz and made wide and important geological studies in Virginia, Pennsylvania and New Jersey, and after several trips back to Europe settled in Cambridge, where he assisted Agassiz in the Museum of Comparative Zoology. From 1853 to 1855 he was in government employ, and from 1875 till shortly before his death was again in the service. Marcou made a section map of the 35th parallel from the Mississippi to the Pacific, and published: 'Geological Map of the United States and British Provinces of North America' (1853); 'A Catalogue of Geological Maps of America' (1884); 'Geology of North America' (1858); 'Life, Letters, and Works of Louis Agassiz' (1896).

Marcus Aurelius, mär'kŭs â-rē'lĭ-ŭs. See AURELIUS ANTONINUS, MARCUS.

Marcus Græcus, grē'kŭs, pyrotechnist and alchemist, with regard to whose life nothing is known. He must have lived not later than the 11th century, since he is cited by an Arabian physician of that date. In the National Library at Paris are two manuscript copies of a small treatise, entitled 'Liber Ignium ad Comburendos Hostes, Auctore Marco Græco,' one of which appears to belong to the 14th and the other to the 15th century. The work contains an account of an explosive substance the ingredients of which are the same as those used in making gunpowder, though differently proportioned. It may have been that Schwartz, the reputed inventor of gunpowder, did nothing more than experiment on the receipts of Marcus Græcus. The treatise also contains the first account that has come down to us of the method of making Greek fire.

Mar'cy, Randolph Barnes, American general: b. Greenwich, Mass., 9 April 1812; d. Orange 22 Nov. 1887. He was educated at West Point in 1832; and served in the Black Hawk War. During the Mexican War he was active at Palo Alto and Resaca de la Palma; and was made inspector-general, U. S. A., with the rank of colonel, in August 1861, serving as chief of staff to his son-in-law, General George B. McClellan throughout the Civil War. He was appointed brigadier-general of volunteers, 23 Sept. 1861, was inspector-general, U. S. A., with rank of brigadier-general from December 1878. He was retired in the year last named. He published: 'Exploration of the Red River in 1852' (1853); 'The Prairie Traveler, a Handbook for Overland Emigrants' (1859); 'Thirty Years of Army Life on the Border' (1866); 'Border Reminiscences' (1871).

Marcy, William Learned, American statesman: b. Southbridge, Mass., 12 Dec. 1786; d. Ballston Spa, N. Y., 4 July 1857. He studied at Leicester Academy, in Massachusetts, and was graduated at Brown University in 1808. At Troy, N. Y., he studied law and was admitted to the bar. When the War of 1812 broke out he volunteered as a lieutenant, was sent at once into active service, and 22 Oct. 1812 led an attack resulting in the capture of a Canadian post at Saint Regis. He was soon promoted to be captain, and served almost to the end of the war. Returning to Troy, he engaged in newspaper work and in politics, opposed Clinton and became prominent in the Albany Regency (q.v.). He had already held several offices when, in 1823, he was elected comptroller of the State. This position he filled six years, and in 1829 was appointed associate justice of the New York supreme court. The Democrats in 1831 elected him to the United States Senate, but the next year he was chosen governor of New York and resigned his senatorship. While in the Senate he was chairman of the Judiciary Committee, and in debate with Clay made a memorable defense of Martin Van Buren. It was during a speech in the Senate vindicating the course of the President in giving offices to his political supporters that Marcy uttered the words associated with the beginning of the spoils system (q.v.): "We can see nothing wrong in the maxim that to the victors belong the spoils." Having served three terms as governor, he was once more nominated, in 1838, but was defeated by W. H. Seward (q.v.). In the following year Marcy was appointed by President Van Buren a commissioner on Mexican claims, serving till 1842. In 1845 he became secretary of war under Polk, and in that office bore arduous responsiblities created by the Mexican War. He also used his official influence in the settlement of the momentous Oregon boundary question. In 1848 he supported Cass as presidential candidate, and when Taylor was inaugurated Marcy retired to private life. But during the administration of Pierce he served from 1853 to 1857 as secretary of state, greatly distinguishing himself at home and abroad by his handling of grave matters,— the Mexican boundary dispute, the reciprocity treaty with Canada, the British fishery question, the Koszta affair (see INGRAHAM, DUNCAN NATHANIEL), etc. On the inauguration of President Buchanan in 1857 Marcy finally retired from office, dying four months afterward. Among statesmen of administrative ability and thorough training, both for domestic and foreign affairs, he holds a high and permanent place.

Marcy, Mount, N. Y., the highest peak of the Adirondack Mountains, in the northeastern part of the State, in Essex County; about 28 miles west of Lake Champlain. The altitude is 5,344 feet. Lake Tear of the Clouds, 4,327 feet above sea-level, usually considered the main source of the Hudson River, is just southwest of Mount Marcy. The Indian name for this peak was «Tahawas,» meaning the «cloud-divider.»

Mar'den, Orison Swett, American editor and author: b. Thornton, N. H. He was graduated at the Boston University in 1877; at the School of Oratory there in 1879; at the Law School of the same institution in 1881; and in 1882 at the Harvard Medical School. He is founder and editor of ‘Success,’ and vice-president of the Success Company, and is the author of many works, among which are: ‘Pushing to the Front’ (1894); ‘How to Succeed’ (1896); ‘The Secret of Achievement’ (1898); ‘Character the Grandest Thing in the World’ (1899); ‘The Hour of Opportunity’ (1900); ‘Talks with Great Workers’ (1901); and ‘Stepping Stones’ (1902).

Mardi Gras, mär'dē grä, Shrove Tuesday, the last day before Lent. (See CARNIVAL.) In the United States the day is observed in New Orleans and Memphis with processions, masquerade balls, and other gay entertainments.

Mardonius, mär-dō'nĭ-ŭs, Persian general, was the son of the Satrap Gobryas, and son-in-law of Darius Hystaspes. He commanded the first Persian armament sent against Greece, 492 B.C., when a storm at Mount Athos destroyed his fleet, and his army was beaten in Macedonia. He accompanied Xerxes in his invasion of Greece, of which he had been the chief promoter; and after the battle of Salamis, and the return of Xerxes to Asia, Mardonius was left in occupation at Athens, which he held for 10 months. According to Herodotus he was defeated by Pausanias, and probably killed at the battle of Platæa, 479 B.C.

Mare Clausum, mä'rē klâ'sŭm, a Latin phrase meaning closed sea, or that portion of the sea under the jurisdiction of a particular nation or government, as distinguished from the high sea. See INTERNATIONAL LAW.

Mare Island, Cal., in San Pablo Bay, and a part of Solano County; 28 miles north of San Francisco, and opposite the city of Vallejo. A United States naval station, one of the largest in the country, is on this island. It has wet
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Mare's Tail, a genus (*Hippuris*), of plants with whorled narrow leaves and small inconspicuous flowers set in their axils. They are aquatic or marsh plants. *H. vulgaris* is very common in Europe and has become naturalized in the interior of the United States.

Maretzek, mä'rĕ tsĕk, **Max,** American musician: b. Brunn, Austria, 28 Jan. 1821; d. Pleasant Plains, Staten Island, 14 May 1887. He was educated at the University of Vienna, but desirous of a wider field went to London and was connected for a time with its Italian Opera as chorus-master, writing in addition some music. In 1848 he came to New York, where he was appointed leader of the orchestra at the Italian Opera and subsequently at the Astor Place Theatre and the Grand Opera House. He wrote the operas of 'Hamlet,' 'Sleepy Hollow,' and 'Crotchets and Quavers' (1858). Under his management many notable operas and artists, among the latter Adelina Patti and Pauline Lucca, were presented to American audiences.

Marforio, mär-fō'rĭ-ō, the popular name of a colossal statue representing the river Rhine, or Danube, or river God, standing in the court of a wing of the Capitol at Rome. The name Marforio is a corruption of *Martis forum* (the forum of Mars), in the entrance of which the statue originally stood.

Margaret, Saint, queen of Scotland, elder sister of Edgar Ætheling, and granddaughter of Edmund Ironside: b. Hungary about 1045; d. Edinburgh 16 Nov. 1093. Shortly after William the Conqueror had established himself on the English throne she and her brother Edgar went to Scotland and placed themselves under the protection of Malcolm Canmore, the Scottish king, who in 1070 became her husband. She was characterized by great devotion to the church, and it was largely through her influence with the king that the Scottish Church was brought into conformity with those of England and the Continent. She is said, moreover, to have elevated the manners of the Scottish court, and introduced great improvements in needlework, embroidery, and other similar arts. In her personal life, and the great care with which she educated her children, she set a noble example to the people of the somewhat rude and uncultured kingdom. In 1250 she was canonized. Her daughter Matilda married the English king, Henry I., and thus the old Anglo-Saxon line became united with that of the usurping Normans. There is an ancient life of Saint Margaret, written in Latin, it is commonly believed by her confessor Turgot, bishop of St. Andrews. The Bodleian library at Oxford contains a copy of the Gospels which once belonged to her.

Margaret, queen of Denmark, Norway, and Sweden, daughter of Waldemar III., king of Denmark: b. Copenhagen 1353; d. 28 Oct. 1412. She was married to Hakon, king of Norway, in 1363, and the death of her husband in 1380 placed Norway in her hands; that of her son Olaf in 1387 enabled her to secure the throne of Denmark, to which she had previously brought about his election; and after defeating Albert, the Swedish king, she also obtained possession of the throne of Sweden. She endeavored to place the union of the three kingdoms on a permanent basis by the celebrated Act of Union, or Treaty of Calmar (1397). She died after having raised herself to a degree of power then unequaled in Europe from the time of Charlemagne. She is sometimes styled «The Semiramis of the North.»

Margaret of Anjou, ăn'joo or äṅ-zhoo, queen consort of Henry VI. of England: b. probably at Pont-à-Mousson, Lorraine, 23 March 1430; d. near Saumur in Anjou, 15 Aug. 1482. She was the daughter of René the Good, of Anjou, titular king of Naples, and was married to Henry in 1445. The imbecility of the king made her practically regent, and her power being contested by the Duke of York, a claimant of the throne by an older line, the protracted Wars of the Roses began. At first victorious, she was afterward compelled to flee to Scotland, but raising an army in the north, she secured, by the battles of Wakefield (1460) and Saint Albans (1461), the death of York, and the release of the king. Her army, however, was soon afterward annihilated at Towton (1461), and Edward (IV.), the son of the late Duke of York, was declared king. She succeeded in obtaining assistance from Louis XI. of France, but was once more defeated, and took refuge in that country. Warwick then became embroiled with the young king, and determined to replace Henry on the throne. Edward was in turn obliged to escape to the Continent, but obtaining assistance from the Duke of Burgundy, returned and defeated Warwick at Barnet (1471). Margaret, collecting her partisans, fought the battle of Tewkesbury (1471), and was totally defeated. She and her son were made prisoners, and the latter, when led into the presence of the royal victor, was killed. Henry soon after died or was murdered in the Tower, and Margaret remained in prison four years. Louis XI. ransomed her for 50,000 crowns. See Henry VI.; Roses, Wars of the.

Margaret of Austria, governor-general of the Netherlands, and daughter of Maximilian I. of Austria: b. Brussels 10 Jan. 1480; d. Mechlin 1 Dec. 1530. She was educated at the French court; was betrothed to the Dauphin Charles, who married Anne of Brittany; married John, the Spanish crown-prince, in 1497; and, after his death in the same year, married Philibert of Savoy in 1501, only to be widowed again in 1504. Three years afterward her father made her regent of the Netherlands, where she ruled with much ability although a bitter enemy of the Reformation. She took a prominent part in the peace of Cambrai in 1529, which is called, because negotiated by her and Louise of Savoy, the «Paix des Dames.»

Margaret of Flanders, countess of Flanders and Hainault, sometimes called Margaret of Constantinople: b. Valenciennes about 1200; d. Lille 1279. She was a daughter of Baldwin IX. of Flanders and Hainault, who was succeeded by Margaret's older sister, Jeanne. Margaret's husband, Bouchard, was seized and killed by Jeanne, upon whose death Margaret came to the crown in 1244. Her reign was peaceable, save for the quarrels between her children by Bouchard and those by Guillaume of Dampierre.

Margaret of Navarre, na-vär, or of **Valois,** or of **France,** French princess, daughter of Henry II.: b. St. Germain-en-Laye, France, 14 May 1553; d. Paris 27 March 1615. She married in 1572 Henry of Navarre, afterward Henry IV. of France. It was entirely a marriage of policy, and on Henry's accession to the throne, their marriage was dissolved by mutual consent. She resided thereafter in Paris where her house became the rendezvous for the learning and fashion of the time. Some very agreeable poems by her are extant, and her 'Memoirs' (1842) are extremely curious.

Margaret of Parma, regent of the Netherlands, a bastard of Charles V. of Spain by a Flemish woman: b. Oudenarde 1522; d. Ortona 1586. Brought up in Brussels, she was married to Alessandro de' Medici in 1536, and in 1538 to Ottavio Farnese, duke of Parma, to whom she bore the great general Alexander Farnese. In 1559 Philip II. made her staathouder of the Netherlands. There she sided with Granvella, introduced the Inquisition, and provoked the provinces to revolt by her strong, masculine policy. She resigned in 1567 when Alva was sent to the Netherlands.

Margaret Tudor, queen of Scotland, wife of James IV., and daugher of Henry VII. of England: b. Westminster 29 Nov. 1489; d. Methven Castle 18 Oct. 1541. She was married to the king of Scotland when 14; bore him three children, of whom two, James, later fifth king of Scotland of that name and father of Mary Stuart, and Margaret, mother of Lord Darnley, survived her; and after the king's death (1514) married Douglas, Earl of Angus, from whom she was divorced in 1527, to marry soon after Henry Stewart, Lord of Methven. By descent from Margaret Tudor her great-grandson, James VI. of Scotland, was Elizabeth's successor as James I. of England.

Margaret, or **Marguerite of Valois,** văl-wă, Queen of Navarre: b. Angoulême 11 April 1492; d. Paris 27 March 1549. (Variously known as Margaret of Angoulême, of Alençon, and of Navarre.) She was the sister of Francis I. of France, was brought up at the court of Louis XII., married the Duke of Alençon in 1509, became a widow in 1525, and in 1527 married Henry d'Albret, titular king of Navarre. She never reigned over Navarre, but resided at the French court or kept a court of her own at Nérac and Pau. She was acquainted with the principles of the Protestant reformers, and not only afforded protection to reformed divines, but used her influence with her brother Francis to the same purpose, and was a great patroness of men of letters. In 1553 she published a religious poem, 'Le Miroir de l'Ame Pécheresse,' which incurred the censure of the Sorbonne as heretical. In 1547 a collection of her poems and other pieces was printed under the title of 'Marguerites de la Marguerite des Princesses.' The 'Heptaméron. ou sept Journées de la Reyne de Navarre,' a famous collection of tales long attributed to her, is at present regarded as of composite authorship. She left one child, Jeanne d'Albret; afterward mother of Henry IV. Her letters have been published in modern times. Consult: Comtesse d'Haussonville, 'Marguerite de Valois' (1870); Lotheissen, 'Königin Margaret von Navarre' (1885); Freer, 'Life of Marguerite d'Angoulême' (1895).

Margaret Sidney. See LOTHROP, HARRIET MULFORD STONE.

Margaretta, The, a British armed schooner, captured by Americans near Machias. Maine, 12 June, 1775, in the first naval contest of the Revolution. In April 1774, Captain Ichabod Jones s
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fire, which the heroes of the «fowling-pieces» returned with effect. The vessels coming together, a short musketry fight ensued. Moore himself threw hand-grenades, but was shot down. The Americans — O'Brien at their head — boarded the cutter and soon had complete possession of her.

In this plucky exploit one of the American party was killed and four wounded, one mortally. On the Margaretta four were killed besides her commander, who died of his wound. Her captors triumphantly took the Margaretta to Machias the same day, and her crew were held until July as prisoners of war. So ended «one of the most bold, energetic, and extraordinary occurrences of the times.» With the armament of the Margaretta — four 3-pounders and 14 swivels — the Unity was fitted out, and she was thenceforth called the Machias Liberty.

Margar'ic Acid, or **Heptadecoic Acid**, a name now applied to an acid having the formula $C_{17}H_{34}O_2$, which is said to occur in adipocere (q.v.), and which may also be prepared by boiling cetyl cyanide in alcoholic potash. It was formerly given to a supposed acid having the same formula, which was believed to occur in connection with the saponification of natural fats; but it has been shown by Heintz that the earlier «margaric acid» was merely a mixture of palmitic and stearic acids.

Mar'garin, or **Margarine**, a fatty substance, obtained from lard, and from certain vegetable oils. It was formerly believed to be a distinct fat, or compound of glycerin with «margaric acid» (q.v.); but it is now known to be merely a mixture of stearin and palmitin. See OLEOMARGARINE.

Margarit, or **Marguerit**, **Berenger**, a Spanish general, who lived in the 12th century. In command of a fleet he was sent by William II., king of Sicily, to succor Tyre, besieged by Saladin in 1188. Margarit, with a fire-ship, burned several of the enemy's ships, while Conrad, governor of Tyre, made a sortie. Attacked on both sides at once, Saladin only just managed to find shelter on an undamaged ship, and escaped. The brilliant conduct of Margarit on this occasion gained for him from Saladin the names of King of the Sea and the New Neptune.

Margarit, or **Marguerit**, **John**, a Spanish cardinal: b. Gerona 1415; d. Rome 1484. Successively bishop of Elne, of Gerona, and of Patti (Sicily), he received several important missions under Alphonse V., and became ambassador to Rome under John II., who appointed him chancellor of Aragon. He quelled the troubles which were disturbing Catalonia, and received the cardinal's hat in 1483. He was the author of 'Paralipomenon Hispaniæ' (Granada 1545), a history of Spain from the fabulous arrival of Hercules in the Peninsula, to the reign of Theodosius the Great.

Margarit, or **Marguerit**, **Peter**, a Spanish navigator who lived at the end of the 15th century. He was the nephew of Cardinal Margarit, and left the court of Ferdinand V. in 1492, to embark with the fleet of Christopher Columbus, from whom he separated after some dissensions. According to Blasius he discovered the Marguerite Islands, and gave to them his name. Other authors aver these islands were named after the pearls which are found on their shores.

Margarita, mär-gä-rē'tä, Venezuela, an island off the northeast coast, in the Caribbean Sea, about 30 miles north of Cumana. In 1901 it was made a province and is known by the name of Nueva Esparta. Its area is 450 square miles. This island was discovered by Columbus in 1498. The name Margarita, meaning «pearl» was given to it because of the valuable pearl fisheries once found in its surrounding waters.

The surface is broken by two mountain chains, the highest point of one is nearly 4,000 feet. Near the centre is a lagoon, surrounded by low land. Much of the soil is fertile, but the chief industries are fishing, preparing salt for market, and cattle-raising. The capital of the province is Asunción. The inhabitants are nearly all Indians who have long been civilized. Pop. about 40,500.

Mar'garite, or **Pearl Mica**, a native hydrous silicate of aluminum and calcium, having the formula $H_2CaAl_4Si_2O_{12}$, and usually occurring in laminated forms, like mica. Its crystals, when they occur, belong to the monoclinic system. Margarite is translucent or subtranslucent, with a vitreous or pearly lustre. It occurs in various colors, but predominantly in gray, with perhaps a reddish tint. It has a hardness of from 3.5 to 4.5, and a specific gravity of about 3. Margarite usually occurs in connection with emery or corundum, from which it is often obviously derived.

Margaritone, Italian painter, architect, and sculptor: b. Arezzo 1219; d. 1289. Called MARGARITONE D'AREZZO after his native place, he attained the first rank as an artist of the Greek school, and was held in high esteem by Pope Urban IV. Jealousy at the success of Cimabue is said to have shortened his days. He painted a great number of frescoes, none of which now exist. Among the few remaining pictures from his brush are Saint Francis in the museum at Siena; a Madonna in the Church of Saint Francis at Arezzo; Christ, in the Church of San Croce at Florence; the Eternal Father with the angels in the Church of Saint Bernardin at Perugia. Painting and sculpture are mingled in his Tomb of Pope Gregory X. at Arezzo; his sculptured works are chiefly of wood. Among his architectural works are the cathedral of his native city and the governor's palace at Ancona.

Margate, mär'gāt, England, a seaport and popular summer watering resort of Londoners, in Kent, on the Isle of Thanet, 64 miles by rail east by south of London. The restored parish church of Saint John the Baptist dates from 1050. Margate is patronized annually by about 200,000 visitors. Pop. (1901) 23,057.

Margate-fish, a handsome, pearly white, brown-striped fish (*Hæmulon album*) of West Indian waters, important as a food-fish, and ordinarily weighing about five pounds. It is caught about rocky reefs, in deep water, where it spawns in summer; and at night it comes in shore to obtain the small animals which swarm in the shallows. It is called jallao by Spanish-speaking fishermen, and market-fish, margaret-grunt, etc., by the English-speaking fishermen of Key West and the Bahamas.

Mar'gay, a South American forest-dwelling wildcat (*Felis tigrina*), which is most variably colored and spotted. It is sometimes domesticated in Brazil.

Margherita, mär-gä-rē'tä, queen dowager of Italy: b. Turin 20 Nov. 1851. She is the daughter of Ferdinand, Duke of Genoa. In 1868 she was married to Humbert, then crown prince of Italy, who ascended the throne of Italy in 1878. In that same year an attempt was made upon the life of the king, and the nervous shock to the queen seriously affected her health for a number of years. Her winning personality and dignified performance of her duty as queen gained her wide popularity in Italy. In 1900 her husband was assassinated and their son, Victor Emmanuel III., succeeded him as king.

Margoliouth, mär-gō'lĭ-oot, **David Samuel**, English Oriental scholar: b. London 17 Oct. 1858. He was educated at Winchester and Oxford and has been professor of Arabic at Oxford from 1889. Among his published works are: 'Analecta Orientalia at Poeticam Aristoteleam' (1888); 'Chrestomathia Baidwiana' (1894); 'Letters of Abul 'Ala' (1898); 'Lines of Defence of the Biblical Revelation' (1900); 'Religions of Bible Lands' (1902).

Mar'grave (German, *Markgraf*), in mediæval times in continental Europe, a commander intrusted with the protection of a *mark*, or district on the frontier. As early as the times of Charlemagne marks and margraves appear. The margraves stood immediately under the German kings and emperors. In the 12th century margraviates became hereditary, and at last the margraves acquired the rank of princes of the empire, between counts and dukes.

Marguerite, mär'gĕ rēt, a popular name for several flowers of the order *Compositæ*. The blue marguerite (*Felicia amellodes*), or blue daisy, is a native of southern Africa, and has long been popular in greenhouses and window gardens because of its simple culture and large solitary flower-heads. The Paris daisy or marguerite (*Chrysanthemum frutescens*), a native of the Canary Islands, was introduced into cultivation in Great Britain about the close of the 18th century and has continued a popular florist's flower ever since. It is the one usually obtainable throughout the year in the stores, but especially during the winter. Because of a close resemblance, the name is applied to its near relative, the ox-eye daisy (*C. leucanthemum*), which is common in mismanaged pastures and fields especially in the New England and adjacent States. The Reine marguerite (*Callistephus hortensis*), is better known in America as China aster (see ASTER) and is one of the most popular out-of-door annuals of the garden, being easily grown from seed and readily adaptable to any garden soil. The English daisy (*Bellis perennis*) is also called marguerite, but less frequently. See DAISY.

Maria Christina, ma-rē'ä krĭs-tē'nä, queen of Spain: b. Naples 27 April 1806; d. Havre, France, 22 Aug. 1878. She was a daughter of Francis I., king of the Two Sicilies and was married to Ferdinand VII. of Spain in 1829. Upon Ferdinand's death in 1833, Maria Christina by her husband's will became regent until her daughter, Queen Isabella, should become 18. A civil war which was waged until 1840 ensued, its purpose being to place Don Carlos on the throne, and its outcome was for a long period doubtful, but the queen-regent appeared to care only for her chamberlain, Don Fernando Muñoz, with whom she secretly contracted a morganatic marriage. Her p
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Maria Louisa, loo-ē'zä, second wife of Napoleon I.: b. 12 Dec. 1791; d. Vienna 17 Dec. 1847. She was the eldest daughter of the Emperor Francis I. of Austria and Maria Theresa, daughter of Ferdinand, king of Naples. Her marriage with Napoleon in 1810, after his divorce from Joséphine, seemed to promise permanency to his dynasty and peace to the Continent, and her progress toward Paris through the different provinces of the kingdom formed a kind of trumph. In 1811 she bore him a son, to whom was given the title of King of Rome. In 1813, during Napoleon's absence at the war, he named her regent of the kingdom. After his overthrow she returned to Vienna, and remained there during the Hundred Days. In 1816 she received, with the title of Imperial Majesty, the Duchies of Parma, Piacenza, and Guastalla, and at a later period made a morganatic marriage with her chamberlain, Count Neipperg. She governed her duchies generally with mildness, but the latter part of her reign was much disturbed by revolutionary outbreaks and the very violent means taken to repress them.

Maria Louisa, Order of. See ORDERS AND DECORATIONS.

Maria Theresa, tē-rē'sạ (Ger. tā-rā'zä), German empress, queen of Hungary and Bohemia, archduchess of Austria: b. Vienna 13 May 1717; d. there 29 Nov. 1780. The oldest daughter of the emperor Charles VI., she was carefully educated, was named heir to the throne by the Pragmatic Sanction, and in 1736 married Stephen, duke of Lorraine, who became grand-duke of Tuscany in the next year, and who in November 1740, a month after Maria's accession to the throne of Hungary, Austria and Bohemia, was named joint regent with her. France and Bavaria invaded Bohemia; and at the same time she was beset by Frederick the Great in Silesia, by Spain and Naples in Italy, and by the counter claims of Charles Albert, who was proclaimed first archduke of Austria and then German emperor. She fled from Vienna to Presburg, convoked the Diet, raised a Hungarian army, won the alliance of England, made a secret peace with Prussia, surrendering Silesia and Glatz, and gained peace by the treaty of Aix-la-Chapelle, October 1748, securing the election of her husband as German emperor in return for the cession to Spain of Parma, Piacenza and Guastalla. To revenge herself on Frederick she formed an alliance with Russia, and, by the help of her chancellor, Kaunitz, with France. With the further help of Sweden and Saxony she was preparing to strike at Prussia, when Frederick forestalled her by striking the first blow and opening the Seven Years' War (q.v.). This terrible struggle availed Austria nothing and Maria Theresa had to admit Prussia's right to Silesia in the Peace of Hubertsburg 15 Feb. 1763. Francis I., her husband, died 18 Aug. 1765, and Maria associated with her as emperor her oldest son, Joseph II., but kept in her own hands everything save military administration. Seven years afterward, upon the first partition of Poland, she received Galicia and Ludomeria; and in 1775 Bukovina was granted to Austria by Turkey. The Peace of Teschen, closing the War of the Bavarian Succession, brought Austria the Inn valley in 1779; but the Princes' League (Fürstenbund) under the lead of Frederick II., struck a heavy blow at Austrian supremacy. Though best known for her part in European politics, Maria Theresa was equally great in interior administration; Austrian finance was revived, agriculture encouraged and higher education fostered. The Empress was a strict Catholic and an enemy of the Protestant Reformation, but in the latter part of her reign under the influence of her free-thinking son's policies, she was induced to enact some anti-ecclesiastical legislation, which he subsequently developed into persecutions. She was a pure and noble woman, strikingly beautiful in her youth. Ten of her 16 children survived her. Monuments to Maria Theresa are to be found in Klagenfurt, Vienna, and Presburg. Her letters to her children and her friends were edited by Arneth (1881), who wrote 'Maria Theresia' (1888). Consult also de Broglie, 'Marie Thérèse' (1888); de Villermont, 'Marie Thérèse' (1895); Wolf and Zwiedineck-Südenhorst, 'Oesterreich unter Maria Theresia' (1884); Bright, 'Maria Theresa' (1897).

Maria Theresa, Order of. See ORDERS AND DECORATIONS.

Mariamne, mā-rĭ-ăm'nē, granddaughter of Aristobulus and Hyrcanus, the high-priest, and wife of Herod the Great. Her history is related by Josephus from whom we learn that Herod was devotedly attached to her. She was condemned to death through the machinations of Salome, her husband's sister, on a false charge of adultery, 28 B.C. She met her fate with an intrepidity worthy of her noble ancestry, and was bitterly deplored by the king after her decease.

Mariana, Juan, hoo-ăn' mä-rē-ä'nä, Spanish historian: b. Talavera 1536; d. Madrid 17 Feb. 1623. Taking holy orders he entered the Society of Jesus. To his training at the University of Alcala he owes the pure taste and eloqence of his writings. He taught theology for 13 years with distinction in Rome, Sicily, and Paris, returning to the Jesuits' College at Toledo in 1574, where he wrote his 'Historia de Rebus Hispaniæ' (first edition, Toledo, 1592), in elegant Latin, but afterward translated it into Castilian. His tone is impartial, though he loves Spain and admires Spanish virtue. Though a Jesuit he complains of Pope Alexander VI. Though a Spaniard he is not blindly prejudiced in favor of his king. He describes with sorrow the conquest of Naples; and his censure of Ferdinand is moderated only by considering his good qualities as personal, his bad ones as common to all princes. He has not, however, much claim to originality and borrows largely from Zurita (q.v.). Four editions of the translation appeared during his lifetime, each with corrections and additions. An English translation was made by Stephens, the continuator of Dugdale's 'Monasticon' (London, 1699, folio).

Mariana, mä-rē-ā'nạ, in American colonial history, a name given by John Mason to the tract or territory granted to him between the Salem River and the Merrimac. Here he founded an agricultural settlement and formed the Laconia company in 1629. Mason returned to England in 1633 and died there two years later. In 1691 his heirs sold all his lands and rights in New Hampshire to Gov. Allen.

Mariana (mä-rē-ä'nä) **Islands.** See LADRONE ISLANDS.

Marianna, mä-rĭ-ăn'ạ, Ark., town, county-seat of Lee County; on L'Anguille River, and on the Saint Louis, Iron Mountain & Southern railroad; about 158 miles east of Little Rock. It is in a fertile agricultural region in which cotton is one of the principal crops and in the vicinity are large forests. The chief industrial establishments are lumber-mills, cotton-gins, cotton-compresses, and cottonseed-oil mills. The town is at the head of navigation and has considerable trade by steamers and railroad. The town owns and operates the waterworks. Pop. (1900) 1,707.

Mariazell, mä-rē-ä-tsĕl', Austria, a picturesque mountain village in the north of Styria, near the Salza, 60 miles southwest of Vienna. It is a noted pilgrim resort, annually visited by about 200,000 persons, attracted by the celebrated image of the Virgin and child, enshrined in a handsome church founded in 1363, and rebuilt in 1827. Pop. (1890) 1,152.

Maribois. See NAGRANDIANS.

Maribojoc, mä-rē-bō-hŏk', a pueblo of the province of Bohol, situated on the southwestern coast on Maribojoc Bay, eight miles north of Tagbilaran, two miles from the mouth of the Abalán River. It is an important road centre. Pop. 10,900.

Maricopa, mä-rē-kō'pä, or **Coco-Maricopa,** an Arizona tribe of Indians, a branch of the Yumans, formerly inhabiting the region around the confluence of the Gila and Colorado rivers. Their descendants and the Pimas, with whom they subsequently confederated, are now to be found in the Gila River Reservation to the number of about 400. In their aboriginal state their dress was of the scantiest description, and their dwellings and storehouses were of woven straw and cornstalks over a pole framework. They were an agricultural people and raised large crops by irrigation. Under missionary influence they have been civilized and are now noted for their industry, their efforts at self-improvement, and their manufactures of cotton cloth, baskets, and pottery.

Marie Antoinette, măr'ĭ ăn-toi-nĕt' (Fr. mä-rē äṅ-twä-nĕt), queen of France: b. Vienna, Austria, 2 Nov. 1755; d. Paris 16 Oct. 1793. She was the daughter of the Emperor Francis I. and the celebrated Maria Theresa. She left Vienna for Versailles in 1770, when only 15 to marry the young Duc de Berri, afterward Louis XVI. of France. When her husband ascended the throne in 1774, she gained the affections of the people by repeated acts of generosity. It was, however, soon observed that her natural freedom of manner brought on her the criticism of enemies about the court. It was thought, too, as many believe, with reason, that she was to a certain extent controlled by her mother as an Austrian spy. An extraordinary occurrence added fresh force to calumny and tarnished the fair name of the queen, who was not to blame. This was the affair of the «Diamond Necklace,» in which the Cardinal Louis de Rohan, the great quack Cagliostro, and the Countess de Lamotte were the chief actors. It

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whom she constantly quarreled, partly because of his inconstancy and his open favor to the Marquise de Verneuil, and partly because of her own haughty, obstinate character, which was not unmixed with ambition. For years she urged him to have her crowned queen; the ceremony took place 13 May 1610, and on the next day the king was assassinated. Marie was accused of complicity in the plot, but the charge is not proven. For seven years she acted as regent and showed a strong friendship for Spain and the Catholic Church, being advised by the nuncio and the Spanish ambassador as well as by such favorites as the Concinis. She quarreled with her son, later Louis XIII., was reconciled to him by Richelieu, and upon her attempt to displace the latter was forced by that great minister again to leave court in 1630. Her last years were spent in exile in Belgium, England, and Cologne. The story of her poverty during these years is untrue. Consult Miss Pardoe, ‹Life and Memoirs of Marie de Medici› (1852); Lord, ‹The Regency of Marie de Médicis› (1903).

Marie Pauline, Princess Borghese. See BORGHESE, MARIE PAULINE.

Marienbad, mä-rē'ĕn-bäd, Austria, one of the most frequented and picturesque of the Bohemian watering-places, near the wesern frontier, in a kind of triangular basin formed by several mountain ranges, about 28 miles northwest of Pilsen. The village, built on a slope, surrounded with woods of pine and fir-trees, except in front, has a town-house with assembly-room and reading-rooms; several bathing establishments, theatre, etc. The springs utilized are eight in number and are cold; some are alkaline and containing Glauber's salts, others alkaline and chalybeate, etc. Seven are used externally and internally, one is used for bathing alone. Great quantities of the water are exported. Pop. (1900) 4,588.

Marietta, mä-rĭ-ĕt'ạ, Ga., city, county-seat of Cobb County; on the Nashville, Chattanooga & Saint Louis railroad; about 15 miles north by west of Atlanta. Kenesaw Mountain (q.v.) is west of the city. It was settled about 1840–1 and incorporated in 1852. A city charter was granted in 1885. It is in a fertile agricultural region in which stock-raising is one of the prominent occupations. Large marble quarries are in the vicinity. The chief manufactures are chairs, dressed marble, and machine-shop products. The chief buildings are the churches and schools. The Clarke Library, which contains about 5,500 volumes, is in Marietta. A National Cemetery located here contains the graves of 10,279 soldiers; the unknown dead number 2,967. The mayor and council are chosen at a popular election. Pop. (1890) 3,384; (1900) 4,446.

Marietta was an intermediate objective point in Gen. Sherman's compaign for Atlanta, and when he crossed the Etowah 23 May 1864, his columns were headed for that place by way of Dallas and New Hope Church, but Gen. J. E. Johnston threw his army in his front and checked him at New Hope Church and Dallas. After many hard-fought battles and constant severe skirmishing, Johnston abandoned his Dallas lines (see DALLAS, GA., BATTLE LINES AT) on 4 June, and took position covering Marietta, his left on Lost Mountain, his right beyond the railroad and behind Noonday Creek, with a strong advanced position on Pine Mountain. Sherman repaired the railroad, established a secondary, fortified base at Allatoona Pass, and joined by Blair's Seventeenth corps, advanced 10 June and confronted Johnston in his new and strong position, and by the 14th was strongly intrenched before it in a continuous line of 10 miles. Johnston abandoned Pine Mountain on the night of the 14th, and Sherman advanced his lines, bringing on the engagement at Pine Mountain (q.v.) 15 June. The general movement was continued on the 16th and the right thrown forward to threaten the railroad below Marietta. On the 18th Johnston fell back to a new line, including Kenesaw Mountain, which was strongly fortified, and Sherman pressed in closely on the centre and left, north of Marietta, still continuing the extension of his line to the right, south of it. Johnston, making a corresponding movement by his left, encountered Sherman's right at Kolb's Farm (q.v.) on the 22d. Sherman assaulted Kenesaw Mountain (q.v.) on the 27th, and was repulsed. Flanking operations were then renewed to the right to reach the railroad, and Johnston, finding it in danger and his communications with Atlanta threatened, after being 26 days under an uninterrupted cannonade and infantry fire, abandoned Marietta on the night of 2 July and fell back to a new line, previously selected and intrenched, ten miles south of Marietta, and covering the railroad and his pontoon-bridges across the Chattahoochee, with an advanced position at Smyrna Camp-ground. Sherman occupied Marietta on the morning of 3 July. The Union loss in the operations around Marietta was 1,790 killed and missing, and 5,740 wounded, an aggregate of 7,530. Johnston reported a Confederate loss of 468 killed and 3,480 wounded. Consult: ‹Official Records,› Vol. XXXVIII.; Sherman, ‹Memoirs,› Vol. II.; Van Horne, ‹History of the Army of the Cumberland,› Vol. II.; Johnston, ‹Narrative.›

Marietta, Ohio, city, county-seat of Washington County; on the Ohio River at the mouth of the Muskingum, and on the Cleveland & M., the Toledo & O. C. Extension, the Baltimore & O. S. W., the Zanesville & O., and the Columbus N. R.R.'s; about 95 miles, in direct line, southeast of Columbus, the capital of the State. The first settlement was made in 1788 by people from New England, under Gen. Rufus Putnam, acting for the «Ohio Company» (q.v.) who had secured a grant of lands on both sides of the Muskingum River. The place was named in honor of Marie Antoinette. Arthur Saint Clair organized here July 1788 the Northwest Territory (q.v.). In 1800, Marietta was incorporated as a town. Fort Harmar, built in 1785, was opposite Marietta, and in 1890 the village of Harmar, once the site of the fort, was annexed to the city. The building used as the land office for the «Ohio Company» and an old church, the oldest in the State, are still standing here and in good condition. Many of the pioneers of New England as well as of Ohio, and many of the Revolutionary soldiers, were buried in the Marietta cemetery.

The city is in a coal, iron, petroleum, and gas region, with fertile agricultural lands in the valleys. Some of the manufacturing establishments are the chair factory, employing 650 persons; glassworks, employing 200; tool shops, with 150 employees; brick plant, 300 employees;

boat yards, 75; foundries, 300; other manufactories having in all fully 300 more employees. There are five banks with a combined capital of $500,000; the annual business amounts to over $3,000,000. The principal buildings are the Marietta College (q.v.), public and parish schools, the churches, and the county-buildings. The government is vested in a mayor and council and is administered according to the «Ohio Municipal Code.» The council is composed of six members, two of whom are elected each year. The site of Marietta was once part of a remarkable group of ancient works which consisted of two sections, one containing about 40 acres, the other about 20 acres. The remains of mounds, truncated pyramids, walks, walls, and other ancient works still exist, although the city covers a large part of the original enclosures. Remains of the walls, about five or six feet high by 20 or 30 feet base, may still be seen. Pop. (1890) 8,273; (1900) 13,348. Consult: King, 'History of Ohio'; Hoar, 'Oration at the Celebration of the Centennial of the Founding of the Northwest at Marietta.' A. D. ALDERMAN,
Editor of Marietta 'Register.'

Marietta College, in Marietta, Ohio, founded in 1835 for men and women. It has college and preparatory departments, the latter is known as Marietta Academy. The courses lead to the degrees of A.B., Ph.B., and B.L. Courses are provided for work in music, art, and military science, and short summer schools are given for work in the arts and sciences. The library, which has about 61,000 volumes and 30,000 pamphlets, is noted for its books on the history of the Northwest. In 1903 there were connected with the college 24 instructors and about 300 students. The grounds and buildings were valued at $251,000, the productive funds at $266,000, and the total income $22,500.

Mar'igold, a popular name for several unrelated plants. The pot marigold (*Calendula officinalis*) is one of the most widely popular of garden plants. It is grown for its brilliant flowers which range from white to rich orange, and for its flower-heads, which are often used to flavor soups, stews, and dressings. The African marigold (*Tagetes erecta*) and the French marigold (*T. patula*) are also widely used for ornament. Their flowers are usually some shade of yellow, but some are brown and some striped. The Cape marigold (*Dimorphotheca spp.*) are also grown for ornament but are less popular than the above. The corn-marigold (*Chrysanthemum segetum*) is a weed especially common in European grain-fields, but also cultivated for its flowers, for which the plant is sometimes forced in greenhouses. All these belong to the natural order *Compositæ*. The marsh marigold (*Caltha palustris*) is a member of the natural order *Ranunculaceæ*. It is a well-known plant in marshes and wet meadows. The leaves, gathered before flowering, are widely used as a pot-herb under the name of «cowslip greens.» The name fig marigold is applied to various members of the genus *Mesembryanthemum*, several of which are cultivated for their grotesque forms, their peculiar foliage, etc.

Marikina, măr-ĭ-kē'na, a Brazilian name for a marmoset (q.v.).

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manner. Several genera of pond-skaters have one or two species which frequent the water of estuaries and harbors; these are in all cases wingless, though their fresh-water relations are, as a rule, winged.»

The extreme of adaptation to marine life is shown by the bugs of the genus *Halobates,* also belonging to the family *Hydrometridæ,* with their short anchor-like fore-legs and their immensely long and slender middle and hind-legs, the middle shin and foot being fringed with long hairs. The elongate wingless fore-body of these insects and the greatly reduced hind-body give them a most peculiar and characteristic appearance, and the dense pile wherewith they are clothed keeps them dry. They have been observed gliding over the calm seas of the tropics, often hundreds of miles from land, or clinging to drifting substances whence they could suck food. Consult G. H. Carpenter, ‹Insects, their Structure and Life› (1899); Miall, ‹Natural History of Aquatic Insects› (1895).

Marine Insurance. See INSURANCE, MARINE.

Marines, are troops enlisted for service either on board ship or on shore. They are drilled, disciplined, clothed, equipped, and paid similarly to the land forces. Their duties are to maintain the necessary guards, man some of the guns, form part of the armed crews of the various boats when called away for service, and form a permanent force for landing with the seamen if necessary. In all these matters they are commanded by their own officers. The marines of the European continental nations are not designed for service permanently on board ship; the American navy is the only one besides that of Great Britain in which the marine forms a necessary and definite fraction of a ship's company. United States marines, who are designated as the Marine Corps, distinguished themselves greatly in the operations in Cuban waters in 1898 and in those which led to the rescue of the foreign legations in Peking in 1900. The name marines is also used in the expression: «Tell that to the marines,» signifying utter disbelief in a statement made or story told; it arose from the fact that marines, being ignorant of seamanship, were made butts of by the sailors. See NAVY OF THE UNITED STATES.

Marinette, măr-ĭ-nĕt', Wis., city, county-seat of Marinette County; at the mouth of the Menominee River, on Green Bay, and on the Chicago & N. W., the Wisconsin & M., and the Chicago, M. & St. P. R.R.'s; about 50 miles north by east of Green Bay and opposite Menominee, Mich. The harbor is large and safe, and the river affords opportunity for bringing logs from the forests along its upper course in both Wisconsin and Michigan. Marinette was settled about 1849–50 and in 1887 was incorporated. The water-power is extensive and the lumber industry of Marinette is most important. The large lumber mills are the chief manufacturing establishments of the city. Other industrial establishments are pail factories, paper and pulp mills, box and broom factories, gas and traction engine and iron works, threshing machine factories, furniture factories, and cabinet shops. The city carries on a lake commerce with all the important lake ports. The chief buildings are the city and county buildings, two hospitals, a public library, 20 churches, fine public and parish school buildings, and Our Lady of Lourdes' Institute. In the vicinity is large assembly ground where various religious and educational conventions are held each summer. Pop. (1890) 11,523; (1900) 16,195.

Marini, Giambattista, jăm-bä-tēs'tä mä-rē'nē, Italian poet: b. Naples 18 Oct. 1569; d. there 25 March 1625. He was assisted by the Cardinal Pietro Aldobrandini at Rome, with whom he went to Turin, where he became secretary to the Duke of Savoy, Charles Emmanuel, but the envy of his enemies and his satirical humor involved him in various disputes. Marini's most famous work is the long epic ‹Adone› (1623). His other works include ‹La Lira› (1602–14); and a great collection of miscellaneous poems. Some of his sonnets are among the most perfect in the Italian language. He is the founder of the Marinist school of poetry, of which false, overstrained imagery, far-fetched metaphors, and forced conceits are characteristic features. Consult Menghini, ‹La vita e le opere di G. B. Marini› (1888).

Marinoni, Hippolyte, ē-pō-lēt mä-rē-nō-nē, French inventor: b. Paris 1825. He has invented many appliances for printing which have been of world-wide adoption, among them are a rotary printing-press which turned out 40,000 copies an hour, another which printed in six colors 20,000 copies an hour, and at the Paris Exposition he exhibited a press which printed at a rapid rate two colors on each side of a sheet by one revolution.

Mario, Giuseppe, joo-sĕp'pĕ mä'rē-ō, MARQUIS DI CANDI, Italian tenor: b. Cagliari, Sardinia, 18 Oct. 1810; d. Rome 11 Dec. 1883. After serving in the Sardinian army he went to Paris, where after two years of musical study he was appointed first tenor of the opera, changing his name at the same time from De Candia to Mario. He made his debut 2 Dec. 1838 as Robert in ‹Robert the Devil,› and soon became the leading tenor of the world. His répertoire embraced all the great works of Rossini, Bellini, Donizetti, and Verdi. He married the famous singer Giulia Grisi in 1854 and together they made an operatic tour of the United States. In his later years after his retirement from the stage in 1871 he lost his fortune through speculations, and the next year made a concert tour in this country.

Mariol'atry. See MARY.

Marion, măr'ĭ-ŏn, **Francis,** American soldier: b. near Georgetown, S. C., in 1732; d. Pond Bluff 27 Feb. 1795. He was the youngest in a family of six children. His grandfather, Benjamin Marion, was a Huguenot exiled from France in 1690. At 16 Francis showed his adventurous disposition by embarking on a small vessel bound for the West Indies. It was wrecked and he barely escaped death by starvation. He returned home and worked several years on a farm. In 1760–1 he served in campaigns against the Cherokees. Thenceforth until 1775 he lived on his plantation at Pond Bluff in the parish of St. John.

In 1775 Marion was elected member from St. John in the South Carolina Provincial Congress, which adopted the bill of rights and voted money for raising troops. He was chosen captain (21 June 1775) and took the field against the British and the Tories. He took part in the capture of Fort Johnson (14 Sept. 1775), and because of his ability in organizing and discipline was promoted to major. He participated in the patriot victory (28 June 1776) at Charleston, which gave the Southern States respite from active fighting for nearly three years. Appointed lieutenant-colonel, he led his regiment in the unsuccessful attack on Savannah (September 1779). In 1780 Marion, now a brigadier-general, was obliged to take refuge in forest and swamp. Beginning with a handful of men, less than 20, he gathered recruits, fearless riders and good marksmen, who formed the famed «Marion's brigade.» At times they numbered several hundred. They came and went at their leader's bidding, providing their own equipment and rations. Part of the time they were at work on their farms, planting crops. These rough and ready troopers became the terror of the British regulars and the Tories, although in justice to Marion's men it should be said that they committed no acts of wanton cruelty and burned no buildings on Tory homesteads. The stories of his adventures read more like fiction than history. His scouts kept close watch of the enemy's movements, and detachments of the brigade struck blow after blow, surprising and capturing small parties of soldiers. At times they united with larger bodies of troops for important engagements. After a vain pursuit, Tarleton named Marion the «Swamp Fox.» Failing in his attempt against Georgetown (December 1780), he retired to Swan Island and prepared for a second attack (13 Jan. 1781), which was also unsuccessful. Then he joined with Colonel Henry Lee in reducing Fort Watson (April 1781). After raiding 200 miles of country he commanded the first line in the battle of Eutaw Springs and took many prisoners. For his gallantry in this engagement he received the thanks of Congress. From 1782 to 1790 Marion served in the State Senate and was a member of the State Constitutional Convention in 1790. He opposed harsh treatment of the Tories and condemned the confiscation act of 1782. In 1784 he married a wealthy lady, Mary Videau, who survived him with no children. He was a man of attractive personality. Of slight figure, he was capable of great endurance and accustomed to abstinence. As a leader he was admired and beloved. He justly ranks among the heroes of the Revolution. Consult: Biography by Horry and Weems (1815), Simms, 'Life of Francis Marion' (1844), Tarleton, 'History of the Campaigns of 1780–1781' (1787).

Marion, Ala., town, county-seat of Perry County; on the Southern railroad; about 60 miles west by north from Montgomery. It is situated in a fertile agricultural region, and its industries are connected with the farm products. It is the seat of the Marion Female Seminary, established in 1836; the Judson Female Institute (Baptist), established in 1839; Lincoln Normal School for colored pupils (Congregationalist); and the Marion Military Institute. Pop. (1900) 1,698.

Marion, Ill., city, county-seat of Williamson County; on the Illinois Central railroad; about 150 miles south by east of Springfield. It is situated in an agricultural region in which are large deposits of coal and near which are extensive timber tracts. The chief industries which contribute to the support of the city are coal-mining, lumbering, fruit raising, manufacturing flour and raising cattle. Marion is the chief

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Marion, S. C., city, county-seat of Marion County; on the Carolina N., and the Atlantic C. L. R.R.'s; about 100 miles west of Columbus. It is surrounded by rich farm lands, the chief products of which are tobacco and cotton. It has large cotton mills, cottonseed-oil mills, lumber and flour mills, and foundries. It ships to the large markets considerable tobacco and cotton products. Pop. (1900) 1,831.

Marion, Va., town, county-seat of Smyth County; on the Marion & R. V., and the Norfolk & W. R. R.'s; about 140 miles southwest of Lynchburg. Marion was settled in 1832 and in 1871 was incorporated. The chief industrial establishments are flour and lumber mills and wooden-ware factories. Mining and quarrying in the vicinity contribute to the industrial wealth of the town. It is the seat of the Marion Female College (Lutheran) and the Southwestern State Hospital for the Insane. The water for drinking and domestic purposes is brought from springs in the hills about three miles distant, and the waterworks plant is owned and operated by the town. Pop. (1900) 2,045.

Mariotte, Edme, ĕd-mĕ mä-rē-ŏt, French physicist: d. 12 May 1684. He lived for the most part at Dijon, and was made prior of Saint-Martin-sous-Beaune. He became a member of the Academy of Sciences upon its formation, and was one of the founders of experimental physics. «It is Mariotte,» said Condorcet, «who first in France introduced into physics a spirit of observation and of doubt.» He discovered independently the law known by his name — also discovered by Robert Boyle (q.v.) and known as Boyle's law,— that if the temperature remain constant, the volume of a gas will vary inversely as the pressure.

Mariotte's Law, in physics, the principle that the volume of a gas, under ordinary conditions of temperature and pressure, is sensibly proportional to the reciprocal of the pressure, so long as the temperature remains constant. It is identical with Boyle's law, the latter name being applied to it in the United States and England, and the former in continental Europe. See *Boyle's Law* under GASES, GENERAL PROPERTIES OF, and GASES, KINETIC THEORY OF.

Mariposa (măr-ĭ-pō'sa) **Grove,** Cal., a celebrated grove of gigantic redwood trees in Mariposa County. See SEQUOIA.

Mariposa Lily, or **Butterfly Lily,** popular names for various species of *Calochortus* of the order *Liliaceæ*. The numerous species, all of which are natives of the western United States and British Columbia, are characterized by coated corms; rather leafy, generally branched stems; and showy, six-segmented flowers. Almost all the species are in cultivation for ornament, some, natives of the Colorado desert, being suited to arid conditions, others to fairly moist soils, still others to very cold localities, as species indigenous to the mountains of Sierra Nevada. All will stand extreme cold, but not alternate freezing and thawing, hence their failure under such conditions. The bulbs should be planted in late autumn in any kind of soil. After the tops have become yellow subsequent to flowering in the following year the bulbs should be taken up, divided and kept dry until planting time. They are often grown in pots under glass.

Maripo'san Indians, or **Yokuts,** a linguistic stock of North American Indians formerly occupying a large part of California. They were divided into 24 small tribes or divisions and displayed great political solidarity. Every large natural division, such as a river valley, constituted a tribal territory which had its hereditary chief. The Mariposans were largely vegetarians; but grasshoppers and certain worms were included in their diet. They were very superstitious and considered the coyote and the rattlesnake as sacred. They were a peaceful people, and although they celebrated the war dance they took no scalps. They were devoted to gambling in all its variations. Marriage was a matter of barter and sale, and cremation was a common practice. In 1850 there were 3,000 Mariposans still living, but in 1890 they had been reduced to 170. In 1903 there were scarcely a score of them remaining in the California mission agencies, where they were classed as «desert Indians.» (See also INDIANS.) Consult: Bancroft, 'History of California' (1884); Powers, 'Tribes of California' (1877).

Mariquina, mä-rē-kē'nä, Philippines, a pueblo of the province of Rizal, Luzon, situated seven miles northeast of Manila, on several roads of importance. A medicinal iron spring called the Chorillo is in the vicinity. It is the centre for the manufacture of native shoes, and leather work of various kinds. Pop. 10,300.

Maris, mä'rĭs, **Jakob,** Dutch painter: b. at The Hague 25 Aug. 1837. He early began his art studies at the local academy, choosing landscape as a specialty, and receiving instruction from Ströbel and Van Hove, which latter he followed on his removal to Antwerp. He studied also under Keyser, director of the Antwerp Academy. Going to Paris he came under the influence of the Barbizon school, and reached his full power as a painter of figures and landscape in combination. In 1871 he returned to his native town. He is quite modern in his artistic conceptions and methods of handling, and shows no sympathy with the style of the early Dutch school. His brush work and use of chiaroscuro are essentially French. Among his numerous works are, 'View of Schiedam'; 'View of a Town in Holland'; 'On the Sea Shore'; 'Mother and Children'; 'Bridge and Canal in Rotterdam'. He has also executed water colors and etchings.

Marists, mä'rĭsts, term applied to two modern religious congregations in the Roman Catholic Church. The Marist Fathers, or Society of Fathers of Mary, originated in Lyons (1816), where a number of religious devoted themselves to missionary work, which extended over the Pacific islands and in 1845 passed on to Australia. The Marist Brothers, whose object was the education of youth, were founded a year later at Marseilles, and chose for its field of labor the south of France. The Marist Fathers have 156 members in the United States which they entered 1849. Their headquarters is at Brookland, D. C. They have schools at Manchester, N. H.; Lowell and Lawrence, Mass., and New York.

Maritime Law. See LAW, MARITIME.

Maritza, mä-rĕt'sä, Turkey, a river, the ancient Hebrus, rising as the Topolnitza, near the Bulgarian frontier, in the Balkan Mountains, and flowing through Eastern Rumelia, southeast to Adrianople, where it bends to the southwest, and falls into the Ægean Sea by the Gulf of Enos. It is over 300 miles long, and navigable to Adrianople, about 100 miles from its mouth.

Marius, mā'rĭ-ŭs, **Gaius,** Roman general: b. 156 B.C., in Cereatæ, in the Volscian territory; d. Rome 86 B.C. He won his first military repute at Numantia in 134, beginning his rapid rise from the ranks; was made tribune of the people in 119; increased his political power by marrying Julius Cæsar's aunt; became prætor in 115; went to Spain in the next year, suppressing brigandage there; and in 109 accompanied Metellus to Africa. Two years later he was chosen consul, displaced his superior officer, and made a brilliant campaign. His success was so great that he was elected consul four times in succession (104–101 B.C.)—a proceeding counter to law and entirely unparalleled — so as to meet the invasion of Italy by the Cimbri and Teutones. He defeated the latter tribe at Aquæ Sextiæ in 102, and the Cimbri at the Raudian Fields in 101. In 100 he was again elected consul. He made the fatal mistake of plunging into party politics, allied himself with the most disreputable leaders of the popular party, and, in his envy of the rising fame of the patrician Sulla (q.v.), attempted to remove him from his command in the Jugurthine War. Civil war broke out in 88. Sulla was victorious. Marius fled to Africa, whence he returned to Italy on the successful rising in Rome under Cinna. The first great proscription followed and many of Marius' opponents were killed. Marius was elected consul for the seventh time for 86 B.C., but died soon after he entered upon the office. Consult Beesly, ‘Marius and Sulla’ (1878).

Marius, The Epicurean, a philosophical romance by Walter Pater, published in 1885. The book has but a shadowy plot. It is, as the subtitle declares, a record of the hero's "sensations and ideas," a history of a spiritual journey. Marius is a young Roman noble, of the time of Marcus Aurelius. Like the philosophic emperor himself, he is the embodiment of the finer forces of his day; his temperament being at once a repository of the true Roman greatness of the past, and a prophecy of the Christian disposition of the New Rome. In his earliest manhood he goes to Rome, meets there the philosophic emperor, mingles in the highly colored life of the time, studies, observes, reflects. The book is a remarkable story of spiritual development, as well as of the strange, luxurious, decaying Rome of the 2d century of the Christian era.

Mariut, mä-rē-oot', **Lake,** Egypt. See MAREOTIS.

Marivaux, Pierre Carlet de Chamblain de, pē-ār kär-lā dė shäṅ-bläṅ dė mä-rē-vō, French dramatist and novelist: b. Paris 4 Feb. 1688; d. there 12 Feb. 1763. Of his life practically nothing is known save that he became an Academician in 1742 or 1743. He wrote essays in periodical form, the ‘Spectateur Français’ having a hint of English influence in both matter and name. His novels, especially the unfinished ‘Vie de Marianne’ and ‘Paysan parvenu,’ were a protest against the literary morals of contemporary fiction. But he is best known for such plays as ‘Les Jeux de l'Amour et du Hasard’ (1730), ‘Les Fausses Confidences’ (1738), ‘Le Legs’ (1736), and ‘La Mère confidente’ (1735)
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Markham, Sir **Clements Robert,** English geographer and traveler: b. Stillingfleet, near York, 20 July 1830. He was educated at Westminster School, entered the navy in 1844, accompanied the Franklin Search Expedition of 1850, and then retired from the service. He traveled in Peru in 1852–4 and 1860–1, the second journey being undertaken to get cinchona seeds for planting in India, an experiment described in his 'Peruvian Bark; Cinchona Culture in British India, 1860–1880' (1880). After spending 1865–6 in Ceylon and India, he became secretary of the India Office in 1867 and curator of its Geographical Department in 1868. In 1858 he had been appointed secretary of the Hakluyt Society, of which he became president in 1890. Since 1863 he was secretary of the Royal Geographical Society, and in 1893 became its president. His more important works, several of which were translated into German, are: 'Cuzco and Lima' (1856); 'Travels in Peru and India' (1862); 'The Arctic Navy List' (1875); 'Life of John Davis' (1889, in a series, 'The World's Great Explorers'); 'Major James Rennell' (1895); 'Richard Hakluyt' (1896); and an English version of a Peruvian drama, 'Ollanta' (1871). He edited 'The Geographical Magazine' from 1872 to 1878 and was knighted in 1896.

Markham, Edwin, American poet: b. Oregon City, Ore., 23 April 1852. He spent his boyhood on a ranch in central California, herding cattle and sheep, and later graduated from the California State Normal School at San José and from Santa Rosa College. He studied law, but did not practise; subsequently took up educational work, and was superintendent and head master of schools in California, and principal of the Observation School of the University of California in Oakland. He had for some time been an occasional contributor to some of the leading American magazines, but first gained wide reputation through the publication of his poem, 'The Man with the Hoe,' suggested to him by Millet's picture of the same name. This first appeared in the San Francisco *Examiner* and was later published in a collection entitled 'The Man with the Hoe and Other Poems' (1899). This poem, which had a wide influence and caused much discussion, is intended by the author not merely as a picture of the peasant but as «a symbol of the toiler brutalized through long ages of industrial oppression.» His other publications include: 'Lincoln and Other Poems' (1901); and 'Field Folk, Interpretations of Millet' (1901).

Markham, Jared Clark, American architect: b. Tyringham, Mass., 18 Nov. 1816. He designed the battle monument at Saratoga and has published 'Appeal to the American People in Behalf of National Monuments' (1872); 'Monumental Art' (1884); 'Historic Sculpture' (1886).

Markham, William, English colonial governor in America: b. England about 1635; d. Philadelphia 12 June 1704. When William Penn obtained a charter for Pennsylvania, he made Markham, a first cousin of his, his deputy. Markham had all rights granted to Penn save that of convoking a legislative assembly. On 3 Aug. 1681 he established a council, later chose the site for Philadelphia, and conferred with Lord Baltimore as to the Maryland-Pennsylvania boundary. Penn himself arrived on 27 Oct. 1682, and Markham, whose commission accordingly lapsed, was elected to the council. In 1684–99 he was secretary to the province, in 1686 became land commissioner, and in 1689 an auditor of accounts. When in 1691 the territory now constituting the State of Delaware was detached from the province, he was appointed its deputy-governor, and in 1694–9, as lieutenant-governor, administered both this territory and the province.

Markhor, mär'kôr or -koor, a remarkable goat (*Capra falconeri*). of the mountains of Afghanistan and northwestern India, where it keeps among the highest wooded valleys, ascending and descending only as compelled to do so by the seasonal changes in the depth of the snow. It is of large size, standing about 3 feet tall at the shoulders, and is reddish brown in summer and light gray in winter. «The magnificent beard, extending in the adult males on to the chest and shoulders, and sometimes reaching nearly to the knees, is black in front and gray behind; in the young bucks and the does at all ages it is confined to the chin.» The horns are very different from those of other goats, rising straight up from the forehead, spreading sideways, so as to form a V when seen from in front, and spirally twisted. Specimens have measured 50 inches along the spiral keel. Several distinct local varieties of markhor are known to the Himalayan hunters, who regard this animal as one of the most excellent objects of sport in that region of prime game animals. «Unlike the ibex, which keeps to the rugged crags and steep ravines above the limits of the forest, the markhor delights in rocky forests, and although it occasionally comes out into the open glades, it seeks concealment as much as possible.» Hence its hunting calls for the greatest skill as well as endurance. This goat is often captured, tamed and crossed with domestic goats; and it is believed to have had some influence in originating the Angora breed. Consult: Lydekker, 'Wild Oxen, Sheep and Goats of All Lands' (1898).

Marking-nut, an East Indian tree (*Semecarpus Anacardium*) of the cashew family, having a fruit the receptacle of which is roasted and eaten: The black juice of the unripe fruit serves with quicklime to make an indelible marking-ink.

Markings of Animals. See Coloration, Protective.

Marks' Mills, Engagement at. On 23 April 1864, a train of 240 wagons, escorted by 1,200 infantry, 400 cavalry, and five guns, all under command of Lieut.-Col. F. M. Drake, 77th Ohio Infantry, left Camden, Ark., for Pine Bluff, to get supplies for Gen. Steele's army, then co-operating with Banks' Red River expedition. At 10 A.M. of the 25th, when at Marks' Mills, on the Camden and Pine Bluff road, about eight miles beyond Saline River, Drake was attacked front and rear, by Gen. Fagan's force of 3,000 men — cavalry, mounted infantry, and two batteries — and after a hard fight of more than three hours, during which Drake was severely wounded, and had lost 250 in killed and wounded, the entire train, guns, and the greater part of the cavalry and infantry were captured. About 300 escaped and made their way to Little Rock and Pine Bluff. Incomplete Confederate returns show a loss of 41 killed, 108 wounded, and 144 missing. Fagan's entire loss was about 420. When Steele heard of the disaster he immediately abandoned the idea of joining Banks, left Camden on the night of the 26th for Little Rock, was followed by Sterling Price, had a rear-guard fight at Jenkins' Ferry on the 30th, and continued his retreat to Little Rock. Consult: ‘Official Records,’ Vol. XXXIV.

E. A. CARMAN.

Marl, a mixture of carbonate of lime and clay in various proportions. If the lime predominate the marl is called calcareous; clay marl, or argillaceous marl, has a larger proportion of clay. As marl is hard or not it is called indurated or earthy. Even the more solid marls crumble soon on exposure to the atmosphere, and form a paste if dipped in water; they effervesce in acids, because of the presence of carbonate of lime. Marl occurs in masses and beds, is associated with chalk, gypsum, sand, clay, or compact limestone, and contains important fossil remains. To the presence of carbonate of lime in its composition, marl owes its use as a fertilizer. Hence it happens that many natural mixtures used as manures are called marls, such as the New Jersey green sand-marls, which contain as their principal constituents clay and greensand and usually only 1 or 2 per cent of carbonate of lime. The latter use of the word is scarcely justifiable, especially as it is sometimes applied, notably in England, to substances containing no lime at all.

Marlboro, märl'bŭr-ō, Mass., city, in Middlesex County; on the Boston & M. and the New York, N. H. & H. R.R.'s; about 28 miles west of Boston and 15 miles east of Worcester. Marlboro was settled in 1656 by a colony from Sudbury, Mass., and four years after was incorporated as a town. In 1890 it was chartered as a city. During King Philip's War (1676) the Indians destroyed nearly the whole town. The chief manufactures are boots and shoes, shoe-making machinery, automobiles and automobile-tires, bicycles, carriages and wagons, lamps, electrical machines and supplies, boxes, hose-pipe, wooden-ware, cigars, and machine-shop products. The principal buildings are the high school, city-hall, Saint Ann's Convent and Academy, a public library, G. A. R. building, and a number of churches and schools. The mayor is elected annually and has power to appoint, subject to approval by the council, the police and the members of the street and fire departments. He also appoints the members of the license department. The council elects the members of the health, poor, and water departments. The waterworks are owned and operated by the city. Pop. (1890) 13,805; (1900) 13,607. Consult Hudson, ‘History of the Town of Marlboro, Massachusetts.’

Marlborough, märl'bŭr-ō, or mâl'bŭr-ō, **John Churchill,** DUKE OF, English general and statesman: b. Ashe, Devonshire, 1650; d. Blenheim 16 June 1722. At 12 he became page to the Duke of York (afterward James II.), by whom at 16 he was appointed an ensign. He was present at the siege of Tangiers, and soon after his return rose to the rank of captain. In 1672 he accompanied the Duke of Monmouth to assist Turenne against the Dutch. At the siege of Maestricht he distinguished himself so highly as to obtain the public thanks of the king of France.
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The coast is deeply indented by bays and natural harbors, from which the hills rise abruptly, clothed with magnificent forests. The district is generally hilly or mountainous, with splendid scenery. The amount of arable land is restricted; in the south are the Wairau Plains, one of the finest sheep tracts in New Zealand. Blenheim, the capital, is connected by rail with the seaport of Picton on Queen Charlotte Sound. Pop. (1901) 13,326.

Mar'lin, Texas, city, county-seat of Falls County; on the Houston & T. C. and the International & G. N. R.R.'s; about 150 miles northwest of Houston and 26 miles southeast of Waco. It is situated in an agricultural region in which cotton is the chief product. The industrial establishments include a large cottonseed-oil mill, several cotton gins, and a cotton compress. The trade is chiefly in cotton and live stock. Marlin has a hot water artesian well, 3,350 feet in depth, with a temperature of 147° F. The waters possess medicinal properties which attract a large number of health seekers to the city. Some of the principal buildings are a central school building, fine hotels, sanatoriums, an opera house, and a court-house. Pop. (1890) 2,058; (1900) 3,092.

Marlin, a sportsman's name for the godwit (q.v.).

Mar'ling Spike, or **Marline Spike,** an iron pin tapering to a point, and principally used by sailors to separate the strands of a rope in splicing or knotting. A large wooden pin used for the same purpose is called a *fid.*

Mar'litt, E. See JOHN, EUGENIE.

Marlowe, mär'lō, **Christopher,** English poet and dramatist: b. Canterbury, February 1564; d. Deptford June 1593. He was educated at Cambridge, afterward settled in London, and became an actor as well as a writer for the stage. Besides six tragedies of his own composition, the best known of which are ‘Tamburlaine the Great’ (1590); ‘Edward II.’ (1594); ‘Dr. Faustus’ (1604); and the ‘Jew of Malta’ (1633), he left some translations. Marlowe was the greatest genius of all the English dramatic writers before Shakespeare, between whom and the moralities (see MORALITY) he may be considered one of the connecting links. Notwithstanding defects in construction, and a certain amount or extravagance or even bombast, Marlowe's tragedies are works of high ability. Popular in his own day, it is only in recent times that his eminence as a poet and dramatist has been duly appreciated. His hand has been traced in the 2d and 3d parts of Shakespeare's ‘Henry VI.,’ in ‘Titus Andronicus’ and in ‘Edward III.’ There are complete editions of works by Dyce (1850), Cunningham (1871), and Bullen (1888); and five plays are edited by H. H. Ellis in the ‘Mermaid Series’ (1887). Consult: Symonds, ‘Shakespeare's Predecessors’ (1884); Lewis, ‘Christopher Marlowe’ (1886); Verity, ‘Marlowe's Influence on Shakespeare’ (1886); Fisher, ‘Zur Characteristik der Dramen Marlowes’ (1889).

Marlowe, Julia (MRS. TABER), American actress: b. (*Sarah Frances Frost*), Caldbeck, Cumberlandshire, England, 17 Aug. 1870. She came with her parents to the United States in 1875. In 1882 she joined the Juvenile Opera Company, which presented ‘Pinafore,’ ‘The Chimes of Normandy,’ and other light operas, in which she was known as Frances Brough. Subsequently she took a child's part in ‘Rip Van Winkle.’ She then retired, studied in New York for three years, and then made her metropolitan début as Parthenia in ‘Ingomar.’ In 1888 she began to star in the United States in Shakespearian and other romantic and tragic roles.

Mar'maduke, John Sappington, American soldier: b. Saline County, Mo., 14 March 1833; d. Jefferson City, Mo., 28 Dec. 1887. He studied at Yale and Harvard and graduated from West Point in 1857, and served in the United States army in the West. At the outbreak of the Civil War he entered the service of the Confederate States and rose to the rank of major-general. In 1864 he was captured and was not released until after the close of the war, when he went abroad for a time, and on his return engaged in business and also in journalism. He was defeated for the governorship of Missouri in 1880, but in 1884 was elected and served until his death.

Mar'mala Water, a fragrant liquid distilled in Ceylon from the flowers of the Bengal quince (*Ægle Marmelos*). It is used by the natives as a perfume.

Mar'malade, a jellied or gelatinous preparation made from quinces, peaches, apricots, or oranges, and portions of their rinds, with a mixture of sugar and spice. It is made like the ordinary jams, poured out warm into pots or jars, and sold in commerce as a confection.

Mar'mion, a narrative poem by Sir Walter Scott (q.v.), published in 1808. Its hero is an English knight of that name, who, after various adventures in Scotland, dies at Flodden.

Marmol, José, hō-sā' mär-mōl', Argentine author: b. Buenos Ayres 5 Dec. 1818; d. there 12 Aug. 1871. He was a pronounced Democrat, was banished by Rosas, led the opposition against that dictator, and on its successful termination became senator and librarian of Buenos Ayres. A fervent orator Marmol is better known as the author of ‘La Amalia’ (1866), a historical novel dealing with Rosas' dictatorship, of the popular patriotic poem ‘El 25 de Mayo de 1843,’ and of various dramas.

Marmont, Auguste Frédéric Louis Viesse de, ō-güst frā-dē-rēk loo-ē vē-ēs dė mär-môṅ, Duke of Ragusa and Marshal of France: b. Chatillon-sur-Seine, France, 20 July 1774; d. Venice 2 March 1852. He entered the army as a lieutenant of infantry in his 15th year. In 1792 he changed to the artillery, and at Toulon became acquainted with Bonaparte, who chose him for his aide-de-camp. In the campaign of 1813 he held the command of an army corps in Germany, and fought in the battles of Lützen, Bautzen, and Dresden. In 1814 he fought a final battle under the walls of Paris, but opposition appearing fruitless surrendered to the allies. This proceeding was one main cause of Napoleon's immediate abdication, and brought Marmont into favor with the Bourbons. After the Restoration Louis XVIII. made him a peer of France, but he was compelled to withdraw from Paris by the revolution of 1830, and his name was struck off the army list.

Marmontel, Jean François, zhŏṅ frăṅ-swă mär-môṅ-tĕl, French writer: b. Bort, Limousin, France, 11 July 1723; d. Abbeville, Eure, 31 Dec. 1799. He was educated for the Church, but turned to letters, and became a journalist and dramatist at Paris. In 1758–9 he edited 'Le Mercure,' and in 1763 was elected to the Academy. He wrote tragedies, including 'Denys le Tyran' (1748) and 'Aristomène' (1749); 'Contes moraux' (1761); and the works of fiction, 'Béhsavie' (1767) and 'Les Incas' (1778). His 'Poétique Française' (1763) and 'Eléments de Littérature' (1787) have perhaps a more permanent worth. A collected edition of his writings appeared in 1786–7.

Marmora, mär'mō-ra, or **Marmara, Sea of** (anciently *Propontis*), an inland sea, lying between southeastern Europe and the westernmost part of Asia, communicating with the Mediterranean by the narrow strait called the Dardanelles, and with the Black Sea by the Bosporus. Length from Gallipoli to the head of the Gulf of Izmid, 177 miles; greatest breadth, which is near the centre, rather more than 50 miles; average depth, over 600 feet; maximum depth, 4,000 feet. The gulfs of Izmid and Moudania, on the Asiatic side, are the chief indentations. The largest of several islands is Marmora, famous for its quarries of marble and alabaster, situated near its western end; at the eastern end, on the Asiatic coast, and not far from Constantinople, is a group called the Princes Islands. A current sets from the Black Sea into the Sea of Marmora, which in turn runs into the Archipelago. The tides are hardly perceptible, and the navigation is easy.

Mar'moset, a small American monkey of the family *Hapalidæ*. They inhabit the Brazilian forests, possess long, non-prehensile tails, have a thick wooly fur, and bear a close resemblance to squirrels in appearance and movements, having long hind legs and penciled ears. They are notable, further, for the relatively large size of the brain and the few teeth (32), likening the family more to the monkeys of the Old World than to those of the other American family (*Cebidæ*). They are favorite pets, not only on account of their quaint prettiness, but because of their gentleness and intelligence; but they are exceedingly delicate and rarely survive a change of climate. Their food is varied.

The family includes many species which fall into two divisions — the genus *Hapale* and the genus *Midas*. The former contains the typical marmosets, or ouistitis, as the French call them, of which one species (*H. jacchus*) has long been a familiar pet; and the latter, the silky marmosets or tamarins, which are larger and more varied in their colors and in their ornamental tufts and crests. The best known species is the marikina (*M. rosalia*).

Mar'mot, a large ground-squirrel of the genus *Arctomys*, having terrestrial habits, rather coarse fur, no cheek-pouches, short limbs, and powerful digging claws. In size they vary from about 15 to 25 inches in length, the tail adding from 3 to 12 inches. Several species inhabit the northern parts of the world, in southerly climates, keeping themselves mostly upon mountain heights, but farther north inhabiting lower levels, preferring open or thinly wooded plains. All dig and dwell in burrows, some species gathering into extensive colonies, the hillocks about

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Monothelites were condemned and banished by his successor, Anastasius. The remnant of this party survived in the Maronites (so named from their founder Maron) — a society of monks in Syria, about Mount Lebanon, which is mentioned as early as the 6th century. Another monk, John Maro, or Marum, also preached Monothelitism there in the 7th century. Regarded as rebels by the Melchites (q.v.), or Christians who adhered to the opinions of the emperor, they became, in the country of Lebanon, which is now called Kesrawan, a warlike mountain people, who defended their political as well as their religious independence boldly against the Mohammedans, and who even now, under the Turkish government, resist the payment of a tribute, like the Druses. The political constitution of the Maronites is that of a military commonwealth. Governed by their ancient customary rights, defended from external attacks, they support themselves among the mountains by husbandry and the produce of their vineyards and mulberry-trees. The revenues of all their orders of ecclesiastics are very small, but a common spirit unites them, and in simplicity of manners, temperance, and hospitality, they resemble the ancient Arabians. Revenge for murder is permitted among them, and as a sign of nobility they wear the green turban. Their church constitution resembles very much that of the old Greek Church. Since the 12th century they have several times submitted to the Pope, and joined the Roman Catholic Church, without giving up their own peculiarities. At last Clement XII. induced them to accept the decrees of the Council of Trent at a synod held in 1736 at their convent of Marhanna. After this synod their priests still retained the right to marry, after the manner of the Greek Church; and they continued to administer the sacrament under both forms. The use of the Arabic language was preserved in the church service. Mass was read only in the ancient Syriac. Their head is called the Patriarch of Antioch, although his residence is in the monastery of Kanobin, upon Mount Lebanon; and he gives an account every 10 years to the Pope of the condition of the Maronite Church. Under him are the bishops and other clergymen, who form seven degrees of rank. In Kesrawan are over 200 Maronite convents and nunneries, containing in all from 20,000 to 25,000 members who profess the rule of St. Anthony, and devote themselves to agriculture and gardening. Since 1584 there has been a Maronite college established at Rome for the education and training of their clergy. At present the Maronites are supposed to number about 350,000, and these are distributed into 150 parishes. In consequence of the sanguinary conflicts between the Maronites and Druses, June 1860, both communities are now subject to one governor appointed by the Porte, with the title of governor of the Lebanon. See DRUSES.

Maroons', the name given to runaway negro slaves in Jamaica and in some parts of South America. The name seems to be equivalent to mountaineers, being derived from Spanish, *cimarron*, a fugitive negro or maroon, from *cima* (same as French *cime*), a summit or hilltop. In many cases runaway negroes, taking to the forests and mountains, rendered themselves formidable to the colonists, and sustained a long and brave resistance against the whites. When Jamaica was conquered by the English in 1655 about 1,500 slaves retreated to the mountains. They continued to harass the island till 1795, when they were finally reduced by the aid of bloodhounds. Some of them were removed to Nova Scotia, and afterward to Sierra Leone. Consult: Dallas, 'History of the Maroons.'

Maroquin, măr-ō-kēn'. See MOROCCO (leather).

Marozia, ma̤-rō'zĭ-a̤, Roman lady of infamous reputation, known for her influence at the Papal court: d. Rome 938 A.D. She was the daughter of Theodora (q.v.). According to Luitprand she was the mistress of Pope Sergius, but this is now denied as lacking historical foundation. As mother of John XI., and grandmother of John XII. and Leo VII., she exercised great influence on the political affairs of her time in Italy. She repented and died in a convent.

Marquand, mär-känd', **Henry Gurdon**, American banker and philanthropist: b. New York city 11 April 1819; d. 26 Feb. 1902. He was educated in Pittsfield, Mass., and for 20 years was in the real estate business, afterward becoming a banker and acquiring an interest in various railways and other commercial enterprises. He was a generous patron of the Metropolitan Museum of Art, to which he gave valuable paintings, etc., and among his other benefactions are a pavilion to Bellevue Hospital and a gymnasium and a chapel to Princeton University.

Marque, märk, **Letter of**, a commission granted to the commander of a merchant ship or privateer to cruise against and make prizes of the enemy's ships and vessels, either at sea or in their harbors, under pretense of making reprisals for injuries received. The ship so commissioned is also called a letter of marque or mart. These letters are grantable by the law of nations, but the sovereign power must be called in to determine when reprisals may be made.

Marquesas, mär-kā'sās, or **Mendaña** (mĕn-dä'ña), **Islands**, or **Les Marquises**, Polynesia, an island group in the South Pacific Ocean, lat. 8° to 11° S.; lon. 138° 30' to 143° W. belonging to France since 1842, and composed of 12 islands and islets divided into two groups, the northern and southern. The largest islands are Nukahiva and Hiva-oa. The coasts are generally inaccessible, rising from the water like walls; but in Nukahiva there are some excellent natural harbors. The islands are generally high, some of their mountains reaching an elevation of over 4,000 feet; the intervening valleys are fertile, picturesque, and copiously watered by streams which form numerous cascades. The principal food productions are pulse, yams, cocoanuts, sugar-cane, cotton, and bamboos; hogs also are numerous. The men are well-formed, active, powerful, and all tattooed. The women have regular features, good complexions, fine teeth, and neat hands, and are the finest of the sex to be met with in Polynesia. The people of these islands were formerly cannibals, and though this practice has been discontinued cruelty and ferocity are prevailing characteristics, and the efforts of the missionaries have met with but little success. The Marquesas were discovered in 1595 by Alonza Mendaña de Neyva. They were subsequently visited and described by Cook and the Forsters in 1774, when Hood's Island was added to the group. In 1797 three more were discovered by Ingraham, an American captain, and were named Washington Islands. In 1842 they acknowledged the sovereignty of France. The population steadily decreased during the 19th century, in 1876 being 5,420, in 1900, 4,300.

Marquetry, mär'ket-rĭ (French, *marqueterie*), inlaid cabinet-work in which thin slices of different colored wood, sometimes of ivory, pearl, shell, or metal, are inlaid on a ground usually of oak or fir, well seasoned to prevent warping. The marquetry of Italy possesses much artistic merit. See INLAYING; MOSAIC.

Marquette, Jacques, French Jesuit missionary and explorer: b. Laon, France, 1 June 1637; d. near site of the present Ludington, Mich., 18 May 1675. His recent biographers, M. Alfred Hamy, in 'The Mississippi,' and the Rev. Samuel Hedges, in his book on the burial place of Marquette, tell us that his family was of good social position in his native city. It is evident that he must have had the advantages of early education, as he entered the Jesuit College at Nancy, in 1654, with the intention of joining the Society. He studied and taught, as Jesuit scholastics usually do, at Pont-à-Mouson, Rheims, Charleville, and Langres. In 1666 he was to go as a missionary priest to New France. He arrived at Quebec, 20 Sept. 1666. In the next month, he began his preparation for life among the savages by the study of the Indian languages, at Three Rivers, under the direction of Father Druillettes, who knew all the ways of missionary life. He spent two years in the wilderness, with Father Druillette's log house as his «home,» learning the forest and lake and living, as near as possible, the like of the Redmen. In 1668, Father Marquette was ready to begin work among the Ottawas. From Montreal, he went to Sault Ste. Marie, known to-day as the «Soo,» then marked in French records «Sanda Maria» of the Algonquins. The term «Ottawa,» as used by the Jesuits, included the Sioux, the Miamis, the Sacs, the Winnebagoes, Foxes, Pottawatomies, Chippewas, Beavers, Creeks, Ottawas, Hurons, Menominees, Illinois, and Hurons. From Sault Ste. Marie, he was sent to La Pointe Mission in Lake Superior. The place selected for his work was at Chequamegon Bay. From 14 Sept. 1669, until 1671, when the mission was given up because of the inability of the Hurons to defend themselves against the Sioux, he served and learned much. Father Marquette probably did not foresee that this abandonment meant that there would be no Christian mission on Lake Superior «for over a hundred years»; as the Rev. Samuel Hedges remarks, «There can be little doubt that the Blackrobe sat in their council circle, and took part in their deliberations, which determined their flight.» He says Marquette joined the Hurons in their rush to the South toward the Island of Mackinac, then Machillimackinac. The little town of St. Ignace, named in honor of the founder of the Jesuits, St. Ignatius Loyola, on Moran Bay,— claims the honor of being the spot where Father Marquette built his chapel in 1671. Mackinac Island disputes with St. Ignace the right of precedure, but there can be no doubt, whether a previous mission existed in Mackinac Island or not, that it

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Marquette was something of a surveyor, and his maps are yet in evidence and very valuable. Two birch canoes that could only hug the shore and not dare the open lakes, and seven men,— five *voyageurs* — made up the expedition. Their stores were barely sufficient, their scientific instruments were, as one can easily imagine, inadequate. They were hopeful, hardy, and they knew every mood of the treacherous lakes and the meanings of all the changes in the weather. Marquette had acquired the quick eye and ear of the Indian, and his mind was supple and well-trained; Joliet was not far behind him in wood and water craft. Still, they followed dim rumors. The most interesting of Marquette's reports is that of the second halt at the Indian village of Mascouten, on Lake Winnebago. They had reached the «jumping off» place. Their first halt was at De Pere, the Mission St. Francis Xavier, to which Father Marquette had been recently assigned. They reached Lake Winnebago by way of the Fox River. From Green Bay,— the Mission St. Francis,— they went to Lake Winnebago, and, from thence, accompanied by the Indian guides, they ascended the upper Fox River and entered the Wisconsin, on 10 June 1673. After seven days of hard paddling, they entered the Mississippi on 17 June. The report of this expedition on which we must rely for information is Marquette's,— Joliet's having been lost in the upsetting of his canoe at the La Chine Rapids, near Montreal. It is included in the 'Jesuit Relations,' and quoted by John Gilmary Shea, Sparks, Parkman, Thwaites, Hedges, and all who have written of the early days of the Northwest. Dr. Shea, in his 'Discovery and Exploration of the Mississippi Valley,' estimates the distance traveled by Marquette and Joliet from St. Ignace to Green Bay (Mission St. Francis Xavier), at 218 miles. General Wood, Inspector-General United States Army, makes the whole distance traveled 2,549 miles, but he omits the distance from St. Ignace to Green Bay. Marquette and Joliet explored the Mississippi for 300 miles in solitude. Marquette describes the river at its junction with the Missouri as turbulent in the extreme. Marquette was pleased by the treatment received at the first village of Illinois Indians. They met Indians who showed traces of civilization; they were tormented with mosquitoes and they saw traces of iron. At the mouth of the Arkansas, they met with great kindness from the Indians. From the Illinois,— believing the route to be shorter,— they went, it is asserted, to a point near Chicago. By portage, at Sturgeon Bay, they saved time and strength, and from the Green Bay into the Fox River, they reached the Mission St. Francis,— having spent, from the beginning of their ascent of the newly discovered river, on 17 July, about two months,— four months, in all, of almost incessant hardship since they began their voyage on 17 May 1673. Further journeying was out of the question. Marquette and Joliet had not much strength left. A journey of nearly 3,000 miles, in birch canoes, had told on them, hardy as they were. Marquette spent 13 months at De Pere, endeavoring to regain his health. He knew well the stupendous importance of what he had done for France and for the world; but his business was with souls. While Joliet went to Montreal to report, Marquette started to found a new mission in Illinois. He left the Mission St. Francis on 25 Oct. 1674, with 10 canoes; he arrived at the Chicago River 4 December. The description of the carrying of the canoes through the forests gives a glimpse of the difficulties the missionary expected to encounter. The inundations of 30 March 1675 destroyed their hovel. At Haskasian Marquette's heart was filled with gratitude by the kindness he received. His desire for exploration led him, while using his strength in ministering to the Indians, to explore Lake Michigan farther. He grew weaker, and turned to the North. Through the river,— now Pere Marquette,— he made his homeward way. On Saturday, 18 May 1675, he died. The Ottawas,— under that name were included the tribes under the Jesuits in the Lake regions,— had among them several Hiskakons, to whom Marquette had been much devoted. These, going northward in the spring, raised his body, reverently prepared it according to the mode of their tribe, took it to the Mission St. Ignace, where Fathers Nource and Piersin awaited it. On Tuesday, 9 June 1676, Marquette was buried in the centre of the chapel of St. Ignace, a building which was destroyed by fire in 1706. In September 1877, Father Edward Jacker, pastor of St. Ignace, discovered the grave and remains of the great and good explorer, and they rest under a monument erected by the citizens of St. Ignace in 1882.

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Marquette, mär-kĕt′, Mich., city, county-seat of Marquette County; on Lake Superior, and on the Duluth, S. S. & A., and the Lake Superior & I. R.R.'s; about 58 miles north by west of Escanaba, on Lake Michigan. The first permanent settlement was made in 1899 after public accounts had been given of the mineral wealth of the Upper Peninsula. It was incorporated in 1851 and chartered as a city in 1869. It was named after Père Marquette (q.v.) who had visited this section as a missionary to the Indians. It has a fine harbor with a breakwater 3,000 feet in length, and the best of facilities for loading steamers with the minerals, especially iron ore, which are shipped from here in large quantities. The ore docks are the largest and best fitted of any in the country. It has steamer communication with all the important lake ports. Near the city are large quarries of brownstone which furnish employment to a number of people. The chief industrial establishments are a planing-mill, two blast furnaces, steam-engine works, and the stone quarries, all employing about 800 men. Other smaller industries are the manufacturing of furniture, sash, door, and blinds, and bricks. The principal buildings are a government building which cost $150,000, a county court-house, cost $250,000; Peter White Library, the building cost $75,000, and the 15,000 volumes are valued at $30,000; a city hall, cost $60,000. The educational buildings are a State Normal School, which cost $150,000, eight public schools, cost $500,000, a manual training school, and Saint Joseph's Academy. It has Protestant Episcopal and Roman Catholic cathedrals, Saint Mary's Hospital, the Upper Peninsula State Prison, and a House of Correction. The Federal Government presented to the city Presque Isle, about 400 acres, a short distance north of the city proper. The place has been improved and made into a beautiful park. A statue of Père Marquette is in a city square, near the shore. The three banks have a combined capital of $400,000, and the annual business amounts to $7,500,000. The government is vested in a mayor and a council of 16 members who are elected annually. The electric-light plant and waterworks are owned and operated by the city. Pop. (1890) 9,093; (1900) 10,058.

FRANK J. RUSSELL,
Editor 'Mining Journal.'

Marquez, José Arnaldo, hō-sā' är-näl'dō mär-kāth, Peruvian poet: b. Peru about 1825; d. Lima 15 Jan. 1881. For participation in civil wars he was several times banished in the earlier part of his career and he lived variously in Chile, Cuba, and the United States. Among modern Peruvian poets Marquez takes high rank. He published: 'Lost Notes' (1862); 'Flor de Abel,' etc., and in prose 'El Peru y la Espana moderna'; and 'Recuerdos de un viage á los Estados Unidos de America.' He lost his life in the defense of Lima against the Chileans.

Marquez, Leonardo, Mexican soldier: b. Mexico about 1820. In 1849 he appeared as the leader of a movement in support of Santa Anna, and under Santa Anna's last administration he had important posts in the army (1853–5). He fought against Juarez in the "Reform" war, and favored the establishment of Maximilian's empire. In October 1866 Maximilian made him a division commander, and in March 1867 sent him to Mexico City to form a cabinet and raise troops for the relief of Querétaro. But he was hemmed in by Diaz, and after Maximilian's execution, resigned and went to Havana. He was frequently called "the tiger of Tacubaya," from his execution there of a large number of prisoners (11 April 1859); though he alleged the express order of Miramon as an explanation. He was exempted from the amnesty of 1870.

Marquis, mär'kwĭs, or **Marquess** (Italian, *marchese;* French, *marquis;* German, *markgraf*), a title of honor next in dignity to that of duke. Marquises were not known in England till King Richard II., in the year 1385, created his great favorite Robert Vere, the earl of Oxford, Marquis of Dublin. In 1397 the same king raised John de Beaufort, earl of Somerset, to the rank of marquis, a dignity which he afterward refused to bear from its being an innovation. The title fell into disuse until the reign of Edward VI., who created the Marquisate of Winchester in 1551. The title given a marquis in the style of the heralds is *most noble and potent prince.*

Marrakesh. See MOROCCO.

Marriage, a solemn contract between a man and woman, by which they are united for life, and assume the legal relation of husband and wife. It has existed in all ages and probably in all nations, though with very different degrees of strictness. It is not the invention of legislators, but arose from the instincts and necessities of society, and its continuance has been provided for by the dictates of experience. Different localities have different forms of the institution, the most broadly marked of which are connected with the right to have only one wife — *monogamy;* or a plurality of wives — *polygamy.* Th
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From the beginning, in all the New England colonies, obligatory civil marriage was either practised or authorized by law. Considering the times an excellent system of notice, license, and registration was speedily developed. Save for the brief period of the Commonwealth, the mother country had nothing to compare with it until the civil marriage laws of 1836 appeared. For many years celebration before a clergyman as such was illegal. The first marriages solemnized by religious rites took place in the Andros period. But later throughout New England the religious ceremony was sanctioned; and long before the close of the provincial era the present dual system of lay or religious celebration, at the option of the contracting parties, was in full use. In the middle colonies also the optional plan existed; but the matrimonial laws of the South were enacted mainly under the influence of the Established Church. In Maryland, however, until 1777 either the religious or the lay celebration was permitted; except that after 1717 members of the Established Church were required to conform to the English ritual. Under restrictions in favor of the church civil marriage was likewise permitted in the Carolinas; and by custom the optional system seems also to have existed in Georgia, where before the Revolution there was no legislation on the subject. In Virginia the religious ceremony according to the forms of the English Church was prescribed. Not until 1780 were dissenters there allowed to celebrate wedlock according to their own rites; while three years later was taken the first step toward civil marriage. But in Virginia as well as in the Carolinas the dissenters often took the law into their own hands, marrying in accordance with their own religious customs, or resorting to the civil magistrate. At the Revolution, therefore, it seemed clear that the American type of matrimonial law and administration, as first developed in the New England colonies, must eventually triumph throughout the land. Yet, if after a century and a quarter of legislation, the fifty-three codes of matrimonial law now existing in the States — using «States» in this article to include the continental and insular districts and territories — reveal in their broader features an approximation to a common system; in their details they disclose almost infinite diversity and conflict, often attended by a want of clearness and precision.

State Laws.— Everywhere in effect, though not always expressly, matrimony is treated as a relation partaking of the nature of both contract and status. Many of the States have enacted formal definitions. In Indiana, Oregon, and Washington marriage is defined briefly as a civil contract; in Arkansas, Colorado, Indian Territory, Iowa, Kansas, Missouri, Nebraska, New Mexico, Oklahoma, and Wyoming, as a civil contract to which the consent of parties capable in law of contracting is essential; in Michigan, Minnesota, Nevada, New York, and Wisconsin it is such a contract «so far as its validity in law is concerned»; while in Alaska it is a civil contract which may be entered into by males of 21 and females of 18 years, otherwise capable. The code of Porto Rico declares that «marriage is a civil institution, originating in a civil contract whereby a man and a woman mutually agree to become husband and wife and to discharge toward each other the duties imposed by law. It is valid only when contracted and solemnized in accordance with provisions of law.» Several commonwealths have sanctioned a definition which seems to imply the element of status in the marital relation. Thus by the laws of California, Idaho, Montana, North Dakota, and South Dakota, marriage is a personal relation, arising out of a civil contract to which the consent of parties capable of making it necessary. In North Dakota, although marriage is a personal relation so arising, it must be «entered into, maintained, annulled, or dissolved» only as provided by law; in California, since the reform of 1895, consent must be followed by a solemnization authorized by the code; and in South Dakota the consent to a marriage «must be to one commencing instantly, and not to an agreement to marry afterwards.» The law of Ohio is similar; and in Idaho and California neither party to a nuptial contract is «bound by a promise made in ignorance of the other's want of personal chastity, and either is released therefrom by unchaste conduct» of the other, unless both participated therein. The law of Louisiana «considers marriage in no other view than as a civil contract. . . . Such marriages only are recognized by law as are contracted and solemnized according to the rules which it prescribes.» Since they are thus considered by the law merely as civil contracts, «it sanctions all those marriages where the parties, at the time of making them, were (1) willing to contract; (2) able to contract; (3) did contract pursuant to the forms and solemnities prescribed.» In Georgia, «to constitute a valid marriage . . . there must be (1) parties able to contract; (2) an actual contract; (3) consummation according to law.» To constitute an actual contract «the parties must be consenting thereto voluntarily, and without any fraud practised upon either. Drunkenness at the time of marriage, brought about by art or contrivance to induce consent,» is held to be a fraud.

The Age of Consent.— The statutes of most of the States prescribe the minimum age of consent to marriage — not to be confused with the «age of consent» to carnal union under the criminal laws enacted to protect a child from legally agreeing to her own ruin; and where the statute is silent the common law age of 12 years for females and 14 for males is probably in force. For males the age is 21 in Alaska and Washington; 18 in Arizona, California, Delaware, Idaho, Indiana, Michigan, Minnesota, Montana, Nebraska, Nevada, New Mexico, New York, Ohio, Oklahoma, Oregon, Porto Rico, South Dakota, West Virginia, Wisconsin, and Wyoming; 17 in Alabama, Arkansas, Georgia, Illinois, and Indian Territory; 16 in District of Columbia, Iowa, North Carolina, North Dakota, Texas, and Utah; 15 in Kansas; and only 14 in Kentucky, Louisiana, and Virginia. For females the age is 18 in Alaska, Idaho, New York, and Washington; 16 in Arizona, Delaware, Indiana, Michigan, Montana, Nebraska, Nevada, Ohio, Porto Rico, West Virginia, and Wyoming; 15 in California, Minnesota, New Mexico, Oklahoma, Oregon, South Dakota, and Wisconsin; 14 in Alabama, Arkansas, District of Columbia, Georgia, Illinois, Indian Territory, Iowa, North Carolina, Texas, and Utah; 13 in New Hampshire and North Dakota; and only 12 in Kansas, Kentucky, Louisiana, and Virginia. But the Porto Rico code provides that a marriage under the age of consent «shall, nevertheless, be valid *ipso facto* and without an express declaration, if one day after having arrived at the legal age of puberty the parties shall have lived together without the representatives of either of them having brought suit against its validity, or if the woman shall have conceived before the legal age of puberty or before having established such suit.»

The age below which the consent of parent or guardian is required for the marriage of a minor is prescribed in the majority of the States. Such consent must precede the granting of license; or, where the license system has not been adopted, it must be made known by certificate or otherwise to the person or society conducting the celebration before the ceremony may be performed. For males the age is 21 years in Alabama, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, District of Columbia, Florida, Illinois, Indiana, Indian Territory, Iowa, Kentucky, Louisiana, Maryland, Massachusetts, Maine, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Jersey, New Mexico, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Porto Rico, Rhode Island, South Dakota, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, and Wyoming; 18 in Idaho and North Carolina; and 16 in Tennessee (1899). For females the age is 21 years in Connecticut, Florida, Kentucky, Louisiana, Pennsylvania, Porto Rico, Rhode Island, Virginia, West Virginia, and Wyoming; 18 in Alabama, Arkansas, California, Colorado, Delaware, Illinois, Indiana, Indian Territory, Iowa, Massachusetts, Maine, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Jersey, New Mexico, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, South Dakota, Texas, Utah, Vermont, Washington, and Wisconsin; and only 16 in Arizona, District of Columbia, Idaho, Maryland, and Tennessee. The age for females is 18 in Georgia; but by the statutes of that State parental consent does not seem to be required for male minors, nor for females when publication is by banns. In effect the same appears to be the case in South Carolina, since a penalty is affixed for marrying a female under 16 without parental consent; while for male minors such consent is not prescribed. In some cases the statute contains important special provisions regarding the marriage of minors which modify the general rule as to age and parental consent. Thus in Maine and Massachusetts consent is only required when the minor has a parent or guardian living in the commonwealth. The Rhode Island law expressly provides that a license may be issued to a person of over 18 years when such person has no parent or guardian residing in the State; and the same is true in Connecticut of a female under age when a selectman of the town where she has last resided six months gives his consent. In Alabama, Florida, Maryland, Virginia, West Virginia, and the District of Columbia, as in some other States, it is expressly provided that parental consent is not required if the minor has been previously married. B

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corder in Idaho; county ordinary or his deputy in Georgia; and the county auditor in Washington. In the six New England States the license, or «certificate,» as it is usually called, is issued by the clerk or registrar of the city or town; and in Massachusetts a town of more than 2,000 inhabitants may choose a person other than the clerk to be registrar. The laws of the various States show great diversity and lack of precision regarding the place of obtaining the license and that of making return of the celebration. In some States the license must be secured in the place of the bride's residence; in others, in that of the marriage; while in a third group, it may be issued in the place where either person dwells. Indeed, Pennsylvania, more liberal still, allows a choice among all three places. The same laxity exists as to the place of return; and sometimes the place of return is not the same as that of issue. There are other grave defects in the license laws. The oath administered to the bride or bridegroom by the officer, to guard against illegal contracts, is usually permissive, not obligatory; and where parental consent to the marriage of minors is given in writing, the affidavit of at least one witness is not always required. In Porto Rico the municipal judge may not grant or refuse a marriage license until ten days after the examination on oath of the persons applying therefor. Nowhere else is there any adequate provision regarding notice or the filing and trial of objections to a proposed marriage. Maine and Wisconsin have each made a good beginning by requiring the certificate or license to be procured five days before the celebration; and New Jersey exacts the same delay in case of non-residents. No other State seems to have a similar provision; and in all cases, apparently, except in Porto Rico, the license is issued at the time the notice of intention to marry is filed. But some of the States have provided special safeguards against clandestine marriages. Massachusetts has thus taken wise precautions regarding the licensing of young minors. By an act of 1894 no town or city clerk is permitted to receive a notice of the intention of marriage of any male under 18 or any female under 16 years of age, unless the «judge of probate in each county after due hearing» shall «make an order allowing the marriage under the age specified»; but such order may be issued only when the minor resides in the county where the judge holds court, or when the father, mother, or guardian gives consent. A law of 1899 allows the probate judge to make a similar order in case of a person of either sex whose age is alleged to exceed that just specified, but who is unable from any cause to produce official record of his or her birth, to overcome the reasonable doubt of the clerk or registrar. In Alabama, before issuance of a license for the marriage of persons under the ages of 21 and 18 respectively, the judge of probate, in addition to parental consent, «must also require a bond to be executed in the penal sum of two hundred dollars» payable to the State, «with condition to be void if there is no lawful cause why such marriage should not be celebrated.» In all cases a similar bond is required in Arkansas, Indian Territory, and Tennessee; as also in Kentucky when the persons are personally unknown to the clerk. By the code of Porto Rico (1902) the «persons desiring to contract marriage shall first present themselves before the municipal judge of their domicil if they shall have the same domicil, otherwise to their respective municipal courts and first being duly sworn, shall be examined by the municipal judge as to their legal capacities and incapacities to enter into matrimony.»

Ceremony.— With two exceptions the optional civil or religious celebration is now authorized by all the States. In West Virginia, and in Maryland since 1777, only the religious ceremony is provided for. Elsewhere marriage may be solemnized before the ministers or priests of every denomination; religious societies having no priests; or before the civil magistrate. The laws are lax regarding the district within which the civil or clerical celebrant may act. Only in a very few instances, as in Massachusetts, Rhode Island, and Vermont, is authority conferred only upon ministers dwelling within the State; while in the great majority of States, although the statutes are often far from clear, all qualified ministers, residing anywhere in the United States, may act. Indeed, Louisiana is still more generous, granting full privilege to celebrate wedlock to any clergyman or priest, «whether a citizen of the United States or not.» Nowhere are the minister's functions confined to the town, county, or other local district of his permanent residence, as was the case under the early laws of some of the older commonwealths. Only in a few cases are adequate proofs of ordination exacted. Virginia and West Virginia each require from the minister a bond for the faithful performance of his trust, in addition to credentials of ordination and good standing. Rhode Island has a careful system of registration; in Maine and New Hampshire the clerical celebrant must secure a «commission» from the governor; in Nevada, Minnesota, Wisconsin, and Arkansas, he must file his credentials with the proper county officer and receive a certificate; Ohio demands a license from the county judge of probate; but usually no such precautions are required. Throughout the country the justice of the peace is the «normal» civil magistrate for the celebration of wedlock; but usually the judges of the county and higher courts of record are given like authority. In Vermont the justice of the peace is the sole officer empowered. On the other hand, in Rhode Island, only justices of the supreme court may perform the lay ceremony; while in Virginia the justice of the peace as such is not recognized; but «the court of every county which deems it expedient, may appoint one or more persons resident in such county to celebrate the rites of marriage within the same, or a particular district thereof,» provided a bond be given as in the case of the ordained minister. Besides the judicial magistrates, authority to solemnize wedlock is conferred *ex officio* upon a variety of other functionaries; as upon aldermen and police magistrates in New York; the governor in Idaho; city mayors in Iowa, Montana, Idaho, Utah, and South Dakota; speakers of the house and senate in Tennessee; and the county supervisors in Mississippi. At present only in 21 States is the justice of the peace or corresponding local officer, in the discharge of his duties as celebrant, confined to his own county or district. Elsewhere he may act anywhere within the State; and this is almost universally the rule with the higher judges and officials who are granted the same power. In no case, except in Virginia and Massachusetts, is there any provision for the appointment of a person to celebrate wedlock for an area of less extent than the county; and nowhere, unless in Virginia, does the law provide for the special office of marriage celebrant. Massachusetts has, however, taken a step in the right direction. By an act of 1899 no justice of the peace may solemnize a marriage unless he also holds the office of city or town clerk, city registrar, clerk of a court, or that of assistant in each case; or «unless he shall have been specially designated by the governor.» The latter may at his discretion name justices of the peace «who may solemnize marriages in the city or town in which they severally reside.» Each place is to have at least one such designated magistrate; but otherwise the number is not to exceed one for every 5,000 of its inhabitants. No justice may act without a certificate of designation, which the governor has power to revoke whenever he thinks fit.

No definite formula for the celebration is anywhere prescribed. Sometimes the statute contains a statement to that effect. Thus in Tennessee it is expressly enacted that no formal ceremony is required, except that the parties «shall respectively declare, in the presence of the minister or officer, that they accept each other as man and wife»; and substantially the same declaration is specified in the laws of California, Idaho, Michigan, Minnesota, Nebraska, Nevada, North Dakota, South Dakota, Oregon, Pennsylvania, Washington, Wisconsin, and Wyoming. The same is true of New York when the ceremony is performed by a magistrate; but when a clergyman officiates, it may be «according to the forms and customs of the church or society to which he belongs.» The Oklahoma law requires the marriage to be «contracted by a formal ceremony» in the presence of two witnesses. The consent of persons «who may be lawfully married,» according to the North Carolina statute, «presently to take each other as husband and wife, freely, seriously, and plainly expressed by each in the presence of the other and in the presence» of a minister or justice, and the consequent declaration by him that they «are man and wife, shall be a valid and sufficient marriage.» In New Hampshire persons living together and acknowledging each other as husband and wife, and generally reputed to be such for the period of three years or until the death of one of them, shall thereafter be deemed to have been lawfully married. A similar law exists in Arizona, except that the requisite period of living together is one year.

Witnesses.— The statutes of many of the States require witnesses at the ceremony. One witness must attend in South Dakota; two in Alaska, Idaho, Michigan, Montana, Minnesota, Nebraska, Nevada, North Dakota, Oklahoma, Oregon, Porto Rico, Rhode Island, Washington, Wisconsin, and Wyoming; three in Louisiana; while in New York one witness is sufficient when the celebration takes place before a minister or magistrate and two when the marriage is by a wri
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kinship or affinity; but the statutes are in this respect exceedingly conflicting and confusing, disclosing a great diversity of conditional or qualifying clauses which make any attempt at a summary here impracticable.

Miscegenation.— Nearly all the southern and some other States have enacted rigorous laws to prevent miscegenation, often defining the exact fractional part of African or Mongolian blood which shall vitiate a marriage. Such statutes against marriage with persons of negro blood exist in Alabama, Arizona, Arkansas, California, Colorado, Delaware, Florida, Georgia, Idaho, Indiana, Indian Territory, Kentucky, Louisiana, Maine, Maryland, Mississippi, Missouri, Nebraska, Nevada, North Carolina, Oklahoma, Oregon, South Carolina, Tennessee, Texas, Utah, Virginia, and West Virginia. The prohibition includes persons of Chinese or «Mongolian» blood in Arizona, California, Mississippi, Nevada, Oregon, and Utah.

Pauperism.— The statutes of several States are particularly interesting as indicating the most recent trend of social legislation. Thus Delaware has attempted to put some limit upon the increase of the indigent and incapable classes, the marriage of paupers being forbidden under penalty. Maine has a similar law; while in Vermont a license may not be issued for the marriage of paupers without the written consent of the selectmen or overseer of the poor of each of the towns where the parties reside, or which are liable for their support. Michigan has taken a still more important step in advance. By a stringent act of 1899 no person afflicted with certain syphilitic diseases «shall be capable of contracting marriage,» transgression of the law being severely punished as a felony. In 1895 Connecticut prohibited the marriage of a couple either of whom is epileptic, imbecile, or feeble-minded, when the woman is under 45 years of age; and this enlightened policy was followed in laws containing the same prohibition by Minnesota in 1901 and by Kansas in 1903.

Common Law Marriages.—It remains to consider the so-called «common-law marriage» in its relation to the statutes. According to the prevailing doctrine of the courts the laws requiring license, solemnization, or other formalities must be interpreted as «directory,» not «mandatory,» unless they contain «words of nullity» clearly declaring marriages void if contracted contrary to their provisions. Thus the canonical conflict between «legality» and «validity» is in effect perpetuated in the United States; and it is a most fruitful source of evil. At present the validity of the informal or common-law marriage is sustained by the decisions of the courts in Alabama, Arkansas, Colorado, District of Columbia, Florida, Georgia, Illinois, Iowa, Indiana, Kansas, Louisiana, Michigan, Minnesota, Missouri, Nebraska, Nevada, Ohio, Pennsylvania, South Carolina, and Wisconsin; by the later decisions in Tennessee (1860–70), and Texas (1894–9); while it is favored by those of New Jersey. On the other hand, in 1810, Chief Justice Parsons of Massachusetts repudiated the common-law agreement, holding that a solemnization according to law was essential to a valid marriage. This precedent has been followed by the courts of Maryland, North Carolina, Oregon, Washington, Vermont, and West Virginia; and favored by the early decisions of Maine and New Hampshire, although in those States the law is regarded as not conclusively settled. Furthermore Kentucky in 1852, Mississippi in 1892, California in 1895, Utah in 1898, and New York in 1901 have superseded the common-law contract through statutes containing the nullifying clause. In the remaining States the courts have not yet reached a decision; but were the question brought to a judicial test, the statutes remaining as they are, it is almost certain that, with one or two exceptions, all these commonwealths would sustain the validity of the informal agreement. It is clear that the needed reform can only be attained through stringent legislation.

II. DIVORCE.— The American type of divorce legislation has its origin in the provincial era. In the five southern colonies before the Revolution no instance of either full divorce or separation from bed and board has been discovered. The statute-book is entirely silent on the subject. Separations by mutual consent or for bad conduct or parol separations in some form did indeed occur; and in such cases the courts sometimes granted separate alimony. But in the South tribunals with either common law or statutory jurisdiction in divorce suits were not established; and no example of legislative divorce appears. The case is somewhat different for the middle colonies. In New York during the period of Dutch rule divorces were granted by the courts; and for a time after the English conquest in 1664 the migistrates may have continued the practice, doubtless under the supposed sanction of the Dutch law. But, unless on this ground during the brief period of transition, judicial divorce *a vinculo* ceased in New York with the English conquest. Courts competent to grant decrees for dissolution of marriage were not created. Except for a passage in the Duke's 'Laws'— which was a «dead letter» — there was no legislation on the subject. What has just been said of New York for the provincial era applies also to New Jersey. On the other hand, in Pennsylvania, a few absolute divorces were granted by the legislature; but there has been found no instance of a judicial decree for dissolution of wedlock.

Civil Divorce.— It was perhaps inevitable that civil divorce, the counterpart of civil marriage, should arise in the New England colonies. Liberty of divorce is the fruit of the Reformation; and it was especially favored by the more advanced or extreme Protestant societies. In most respects throughout New England the broad modern doctrines of the *Reformatio Legum* of Edward VI.'s commission, though even now not fully accepted in the mother country, were from the outset put in practice by Puritan and Separatist alike. The American conception of divorce as belonging, not to the criminal, but exclusively to the civil jurisdiction, has its birth in the 17th century. For more than 100 years in the New England colonies the canonical decree of separation from bed and board was practically though not wholly abandoned; while, on the other hand, a dissolution of the bond of matrimony was freely granted for adultery, desertion, and even on other grounds. For Massachusetts the records are but partially preserved. Between 1639 and 1692 some 40 actions for divorce or annulment have been discovered; while between 1739 and 1776 at least 47 such suits were tried by the courts. The complete record would doubtless disclose many more. The grounds of divorce are not formally specified in the statutes, but from these cases it appears that desertion by either party and adultery of the wife were accepted as adequate causes for dissolving a marriage. It should be noted that before the Revolution there is no clear instance in Massachusetts of granting a full divorce for the husband's adultery alone, unaccompanied by other offenses such as cruelty. The first discovered case of judicial separation from bed and board falls in the year 1754. Cruelty alone was deemed adequate ground for such separation, though, apparently, not for a full divorce. From 1650 onward Rhode Island authorized divorces *a vinculo*. By an act of that year, supplemented by other statutes in 1655 and 1685, adultery and desertion on the part of either spouse were recognized as legal grounds. This colony was especially afflicted by the evil of legislative divorce. Throughout nearly the entire provincial period the assembly, side by side with the courts, acted on divorce petitions, particularly when the grounds of complaint were not those recognized by statute. According to Judge Durfee, even after 1747, when the power to grant divorces came to the superior court, the jurisdiction of the assembly continued «to be invoked in exceptional cases, which either were not provided for by the statute or were too flimsy or too whimsical for judicial treatment» (*Gleanings*, 35–6). The divorce legislation of Connecticut gained a surprisingly early maturity. In the middle of the 17th century no society in the world, with the possible exception of Holland, possessed a system so modern in character. Separation from bed and board was rejected. Reasonable grounds of absolute divorce were sanctioned. Husband and wife were treated with even justice; and, although legislative divorce was permitted and liable to abuse the greater part of the litigation seems always to have been entrusted to the regular courts. As early at least as 1655 marriages were dissolved by the assembly; and in 1667 the first statute on the subject appeared. The court of assistants was then empowered to grant bills of divorce from the bond of wedlock, with the privilege of remarriage, for adultery, fraudulent contract, three years' wilful desertion with total neglect of duty, or for seven years' «providential» absence unheard of. These four grounds of absolute divorce, with scarcely the change of a word in the terms of the statute, were sanctioned by the laws of Connecticut until 1849, when two new causes —«habitual intemperance» and «intolerable cruelty»— were added.

State Legislation.— The essential principles of American divorce law were thus developed in the colonial period. Under the Federal Constitution the States within their respective borders have exclusive control of matrimonial and divorce legislation. Congress has conferred the same power upon the organized territories; but it legislates directly for the District of Columbia, Indian Territory, and Alaska. As a result there are fifty-two distinct divorce codes, whose provisions are inharmonious or conflicting, although in some of their vital features they are slowly approaching a common type. Almost everywhere exclusive jurisdiction in divorce suits is now vested in the district, superior, circuit, chancery,

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Missouri, Nevada, New Hampshire, New Jersey, New Mexico, Ohio, Porto Rico, Texas, Utah, West Virginia, and Wyoming. Elsewhere restrictions are placed upon one or both of the parties either as a penalty or to allow time for proceedings in error or on appeal. Thus in Delaware since 1832 the person divorced for adultery is absolutely forbidden to marry the paramour. Marriage with the accomplice during the life of the former spouse is likewise unlawful in Pennsylvania since 1785, Tennessee since 1799, and Louisiana since 1827. Moreover, in Louisiana since 1808, the wife may not re-wed until 10 months after dissolution of the marriage, whether by death, divorce, or decree of nullity. Under the same conditions in Porto Rico the woman must wait 301 days, or until a child is born if pregnant at the time of the husband's death. By the North Carolina statute, where the ground of divorce is abandonment of the wife or such cruel treatment of her after removal to another State as to force her to return, the defendant is forbidden to marry again during the life of the aggrieved. The same restraint is laid on the defendant guilty of adultery in South Dakota and New York, although the parties to the action may re-marry. In New York, however, the defendant may marry again in case the court shall modify its judgment, «which modification shall only be made upon satisfactory proof that the complainant has re-married, that five years have elapsed since the decree of divorce was rendered, and that the conduct of the defendant since the dissolution of said marriage has been uniformly good.» The person who is the guilty cause of the divorce is restrained from marriage in Florida. By the act of 1901, in the District of Columbia the defendant is absolutely restrained from re-marriage except with the former spouse. In several States the placing of a restraint on further marriage is left to the court's discretion. So in Michigan the court may decree that the person against whom any divorce is granted shall not re-wed within any period not exceeding two years. Since 1857 in Mississippi the decree may provide «that a party against whom a divorce is granted because of adultery shall not be at liberty to marry again.» The same power is given the court in Virginia; but for good cause shown the tribunal rendering the decree of divorce may at any time remove the restraint on the marriage of the guilty party. By the existing code of Alabama, in all cases, the chancellor may in the decree direct whether the adverse party shall be permitted to marry again. In Georgia the jury according to whose verdict a decree of absolute divorce is granted determines the question of re-marriage, subject to the revision of the court; but provision is made for subsequent removal of any disability through the verdict of a new jury. Three of the New England States discriminate in this regard against the defendant. Since 1878, in Vermont, the libellee may not marry any person other than the libellant for three years, unless the latter dies. In Massachusetts since 1881 the offending party, without petition to the court, may re-marry only after two years. Since 1883 the statute of Maine forbids the party obtaining the decree to re-wed in two years without the court's permission; while during that period the adverse party is absolutely restrained; nor at any later time may he marry without the court's consent. In Massachusetts, following the English precedent, the decree in the first instance must be a decree *nisi*, «to become absolute after the expiration of six months,» unless the court on the application of some interested person otherwise orders. Since 1883 the law of Maine in this regard has been practically identical with that of Massachusetts; while in 1902 an act of Rhode Island declares that no decree shall become final and operative until six months after trial and decision. In New York the decree in the first instance must be «interlocutory;» and three months must elapse before it can be made final. The latest legislation of California is somewhat similar. Until 1903 neither party was permitted to marry again within a year after the divorce. But persons evaded the law by going to Nevada, to get married, and then at once returning to California to reside. The validity of such contracts was sustained by a decision of the Supreme Court. To overcome the effect of this decision in the year named it was enacted that when the court «determines that a divorce ought to be granted an interlocutory judgment must be entered, declaring that the party in whose favor the court decides is entitled to a divorce.» After the expiration of a year the court may enter final judgment. In no case can a marriage of either party during the life of the other be valid, if contracted within one year after the interlocutory decree. This act is believed to be unconstitutional, and one of the superior courts has so decided.

A number of States have fixed a period within which neither party may marry again; and usually, if proceedings in error or on appeal be instituted, the restraint is further extended to the final judgment. The period is three months after the decree in North Dakota since 1901; six months in Kansas since 1881, Minnesota since 1901, Nebraska since 1885, Oklahoma since 1893, Oregon since 1862, Washington since 1893; and «more than six months» in Idaho since 1903. It is one year in Colorado since 1893 and in Wisconsin since 1901; while in Montana since 1895 the innocent person must needs wait two years and the guilty person three years before renewing the marital bond with anyone save the former spouse. In Alaska neither party may marry a third person until proceedings are determined on appeal, or if there be no appeal, within one year after the decree. The Nebraska law, in addition to the general restraint on both parties during six months, is unique in forbidding the defendant in error or appellee to marry again during the pendency of proceedings in error or on appeal under the penalty prescribed for bigamy; while in Kansas and Oklahoma, if appellate proceedings be had, the restraint on both parties extends to 30 days after final judgment on appeal. Since 1831, by the Indiana statute, either party is free to marry again immediately after divorce, except that when the defendant has been «constructively» summoned without other notice than publication in a newspaper, the person obtaining a decree is not permitted to re-wed until the expiration of two years, during which period the judgment may be opened at the instance of the defendant. In Wisconsin the court or judge granting the divorce «may authorize» marriage within the year. Expressly or by implication a number of States except from the prohibition the re-marriage of the divorced couple. Such is the case in Alaska, California, Colorado, Idaho, Kansas, Montana, New York, Oklahoma, Oregon, South Dakota, Vermont, and Washington. On the question whether in the absence of statutory authority such re-marriage of the divorced persons with each other comes within the restriction, the decisions of the courts are conflicting (see Moore *v.* Moore, 8 Abb., N. C., 171; Colvin *v.* Colvin, 2 Paige, 385; Moore *v.* Hegeman, 92 N. Y., 521). Owing to the want of precision and uniformity in the legislation of the States the restraints placed on the marriage of divorced persons are practically futile. In 1829 the supreme court of Massachusetts (in Putnam *v.* Putnam, 8 Pick., 433–5) decided that if a man, «being a resident in this State, for the sake of evading the law goes into a neighboring State where such a marriage is valid, and is there married and immediately returns and continues to reside here, the marriage is valid here, and after his death his widow is entitled to dower in his estate.» This precedent was followed by New York in 1881 (Van Voorhis *v.* Brintnall, 86 N. Y., 18); Washington in 1900 (Willey *v.* Willey, 22 Wash., 115–121); and California in 1903, Estate of Wood, 137 Cal., 129). The prevailing doctrine of the courts appears to be that a marriage good where it is contracted is good everywhere; but there are opposing decisions.

Residence.— With the exception of Louisiana and, of course, South Carolina, all of the States make some statutory provision regarding the residence of the parties to a divorce suit. To prevent migration for divorce, the minimum requirement, where the plaintiff comes into the State after the cause of petition arose, has gradually been raised; but in some States the law is still too lax. At present the term of previous residence for the plaintiff, or at least for one of the parties, varies from six months to five years. It is six months in Nebraska since 1856, except when the marriage was solemnized in the State and the plaintiff has there dwelt since the marriage to the time when the suit is commenced; in Idaho since 1864; in South Dakota since 1899; while in Nevada since 1861 the plaintiff must have resided six months in the county where suit is brought, unless the action is begun «in the county in which the cause thereof shall have accrued, or in which the defendant shall reside, or be found, or in which the plaintiff shall reside if the latter be the county in which the parties last cohabited.» In Texas likewise the term for the plaintiff is six months in the county. The prevailing requirement is one year. Such is the case in Arizona, Arkansas, Indian Territory, New Mexico, Ohio, and Oklahoma; in California since 1891; Colorado since 1861, unless the application is made upon «grounds of adultery or extreme cruelty» and the offense is «committed within the State»; Georgia, where six months in the county is also prescribed; Illinois since 1827; and Porto Rico since 1902, unless the cause arose in the State or while one or both of the parties resided there; Iowa since 1838, except when the defendant is a resident of the State served by personal service; Kansas since 1855; Kentucky, where, as in Arkansas and Indian Territory, if the cause of divorce arose without the State the plaintiff must have been a resident of the State
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desertion shall have continued, must be a resident of the State; but when the cause is adultery committed outside the State, three years' residence on the part of either the complainant or the defendant is required. New York has no fixed term, except that in case of partial divorce, when the marriage was solemnized outside the State, the parties must have «continued to be residents» for at least one year, and the plaintiff must be resident at the time the action begins. No definite term is prescribed by the Delaware law; but a divorce from the bond of matrimony will not be decreed when the assigned cause took place out of the State and the «petitioner was a non-resident thereof at the time of the occurrence, unless for the same or like cause such divorce would be allowed by the laws of the State in which it is alleged to have occurred.» Finally, it may be noted that Massachusetts has the most stringent requirement. A divorce will be granted for any lawful cause, occurring in the State or elsewhere, when the libellant has lived for five years in the commonwealth; or, when the parties were inhabitants of the State at the time of the marriage, if the libellant has been such an inhabitant for three years before the libel was filed, provided neither came into the State for the purpose. With these exceptions, as expressly provided in the statute, a divorce will not be granted for any cause, if the parties have never lived together as man and wife in the commonwealth; nor for any cause occurring in another State or country, unless, before it occurred, they had so lived together in the commonwealth, and one of them was there living at the time it took place.

Massachusetts, like Maine, Delaware, and Tennessee, has attempted to prevent clandestine divorce through the evasion of the laws. When an inhabitant of the commonwealth goes outside the State to obtain a divorce for a cause which occurred in the State while the parties there resided, or for a cause which would not be recognized as lawful therein, the «divorce so obtained shall be of no force or effect» in the commonwealth.

Notice by Publication.— Nearly all of the States have made some provision regarding notice to the defendant in divorce suits. The majority are content to prescribe the usual procedure employed in ordinary civil or equity cases, according to the system in use. But some States have adopted special rules; and during the last 15 years a number of the older and a few of the younger commonwealths have enacted rigorous laws governing notice to the defendant when personal service cannot be had. But the abuse of constructive service through publication in the newspapers is still a widespread evil.

Alimony.— Everywhere the laws provide for temporary and permanent alimony to the wife, for the care and custody of the minor children, and for the disposal of the property. In a few instances, as in Massachusetts, New Hampshire, Oregon, Vermont, Virginia, Washington, and West Virginia, the courts are authorized to decree alimony or an allowance in the nature of alimony to the husband as well as to the wife. Generally divorce may be refused when there is collusion, connivance, condonation, or recrimination. Special provisions for defending divorce petitions exist in a number of States. Thus in Indiana and Washington the prosecuting attorney must resist all undefended petitions; in Kentucky the county attorney must resist every application for divorce whether defended or not; in Louisiana, when the defendant is absent or incapable of acting, an attorney shall be appointed by the court to defend him; in Michigan the prosecuting attorney shall appear in all suits where there are children under 14 years of age, and oppose the granting of a decree if he thinks their interest or the public good so requires; and similar laws exist in Idaho, Colorado, Oregon, and the District of Columbia. Soliciting divorce business by advertising or otherwise is sometimes prohibited under severe penalty; such being the case in California, Indiana, Minnesota, Ohio, and Washington. Only in Connecticut, Illinois, Indiana, Maine, Massachusetts, Michigan, New Hampshire, Ohio, Rhode Island, and Vermont apparently, is any adequate provision made for the collection or publication of divorce statistics.

Statistics.— Thus the divorce laws of the States, though still very defective and conflicting, show distinct improvement during recent years. More stringent provisions for notice have been made; longer terms of previous *bona fide* residence of the plaintiff required; more satisfactory conditions of re-marriage after the decree prescribed; while some of the dangerous «omnibus» clauses in the list of statutory grounds have been repealed. All this is due to a better informed public sentiment in the creation of which much credit must be given to the State Commissions on Uniform Legislation and especially to the National Divorce Reform League and its successor, the National League for the Protection of the Family. By the League, at the instance of its secretary, the Rev. Samuel Dike, was suggested the compilation of the elaborate 'Report on Marriage and Divorce in the United States,' prepared by Hon. Carroll D. Wright, Commissioner of Labor, and published in 1889. This report for the first time revealed something like the real facts regarding divorce in the United States. In the entire country during the period of 20 years (1867–86) covered by it, 328,716 petitions for full or partial divorce were granted. From 9,937 decrees in 1867, the number rose to 11,586 in 1871; 14,800 in 1876; 20,762 in 1881; and to 25,535 in 1886; showing an increase in 20 years of 157 per cent, while there was a gain in population of but 60 per cent during the same period. Comparing the last year with the first, only four States — Delaware, Connecticut, Maine, and Vermont — show a decrease in the divorce rate; while, more fairly, comparing the fourth quinquennium with the first, only the three States last named show such a decrease. Of the whole number of divorces during the period, 112,540 were granted to the husband, and 216,176 to the wife. Among the principal causes, at each stage of the wedded life, only for adultery, were more decrees granted on the husband's petition than on that of the wife. But the relative number granted on the wife's petition varies greatly; from 39.3 per cent in North Carolina to 77.9 in Nevada. «As regards the ratio of divorces to marriages, six States report marriages fully enough for a trustworthy comparison. Of these, Connecticut has for the entire period a divorce to 11.32 marriages, and for the worst year, 1875, one to

8.81; Rhode Island gives one to 11.11 for the period and one to 9.36 in 1884, closely approaching that for three preceding years; Vermont one to 16.96 for the period and at its worst, 1871, one to 13; Massachusetts gives one to 31.28 for the period, its worst being one to 22.54 in 1878; Ohio averages one to 20.65, with an almost unvarying progress downward to one to 15.16 in 1886"; and in the District of Columbia the rate for the period is 31.28, while at the best it is 74.65 in 1868, and at the worst 20.82 in 1877 (Dike in ‘Political Science Quarterly,’ iv., 607, summarizing Wright's Report, 135–39). This method of obtaining the rate is defective; for it disregards the large number of married couples whose marriages were solemnized before the period began. Hence, estimating the number of existing married couples, on the basis of the 11th census, in 1867, there were 173 divorces to 100,000 couples, and 250 in 1886 (Willcox, ‘The Divorce Problem,’ 2d ed., 16–19). The divorce rate in the United States is higher than in any other country for which divorce statistics are collected and published, with the single exception of Japan, being lowest in the southeastern and highest in the western and southwestern States. As in Europe, the divorce rate is higher and the marriage rate lower in the city than in the country. Again, as in Europe, while the marriage rate per capita of population is steadily descending, the divorce rate is on the average rising, although during the 20 years in the North Atlantic group of States — from Maine to Pennsylvania inclusive — there was no increase in the divorce rate.

According to Willcox the number of persons divorced (not the number of divorces) to every 100,000 of the population is as follows for various countries, the date being 1886 unless otherwise stated: Ireland, .28; Italy (1885), 3.75; England and Wales, 3.79; Canada, 4.81; Australia (including New Zealand and Tasmania), 11.14; German Empire, 25.97; France, 32.51; Switzerland, 64.49; United States, 88.71; Japan, 608–45 (“A Study in Vital Statistics,” in ‘Political Science Quarterly,’ viii., 78). In the United States, as elsewhere, both the marriage rate and the divorce rate fall during war times and in periods of general industrial depression. According to the statistics presented in Wright's Report, the evil of migration for easy divorce has been much exaggerated in popular opinion. The improvements in the laws since 1886 have placed further restraints upon it; so that it can no longer, if ever, be regarded as the centre of the divorce problem. In the want of a later report — for which there is urgent need — the present divorce rate for the whole country cannot be determined. But from the available statistics furnished by the few States publishing reports it appears that in Rhode Island, Michigan, Ohio, and notably in Indiana the rate is rising; while it is falling in Connecticut and Massachusetts. It is probable that some other State would show a decreasing rate.

Generalization.— In conclusion it may be noted that the earlier movement for a uniform Federal law of divorce, to be secured through constitutional amendment, has in the main been abandoned. Instead it is preferred, through the State Commissions on Uniform Legislation, to urge the adoption by the separate commonwealths of a model statute governing procedure,

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Mars, Anne Françoise Hippolyte Boutet Monvel, än frän-swäz ē-pō-lēt boo-tā môn-věl märs, usually called MADEMOISELLE MARS, French actress: b. Paris 5 Feb. 1779; d. there 20 March 1847. As Célimène in Molière's 'Misanthrope,' and Elmira in 'Tartuffe,' as well as in several similar characters in the plays of Marivaux, she was very great. Louis XVIII. settled on her, as well as on Talma, a pension of 30,000 francs. She retired in 1841.

Mars, märz, in astronomy, a planet, 141,000,000 miles from the sun. Its diameter is 4,200 miles. Its years contain 687 days. Its mean distance at opposition from the earth is 48,000,000 miles. The day on Mars is half an hour longer than ours, or about 24 hours and 37 minutes. It has two moons. It moves at the rate of 15 miles a second. Mars is the fourth planet from the sun, and is called the red planet, from its well-known color. The combination of its motion with ours causes it to pass behind us, or opposite to the sun, once in two years. For two months at this period it is best seen, and appears as a red lamp in the sky; at other times it looks small and unimportant. Its density and size are less than ours; a man weighing 200 pounds here would weigh but 75 pounds on Mars. The orbit of this planet is decidedly elliptical; it is 26,000,000 miles nearer the sun at the nearest part of its orbit than it is at the farthest, consequently the variation in heat from this cause alone is considerable. In many ways Mars resembles our earth; it has atmosphere, seasons, land, water, storms, clouds, and mountains. Snow and ice cover both its poles, and produce great white patches at those points, which are clearly seen through a large telescope; they are found to vary in size with the seasons, being largest during the Martian winter. The canals were first mapped in large numbers by Schiaparelli, although a few of them had been previously observed by other astronomers. They consist of narrow dark lines, generally straight, forming a network over the whole surface of the planet. At their junctions we often find small black dots, known as lakes or oases. Large areas of the planet, called seas, are of a dark gray color, but most of the surface is yellow, or, if observed by daylight, orange. The cause of all the dark regions is probably vegetation, with the exception of the two very black lines which are seen to surround the snow caps when they are melting. These two lines are temporary in their nature, and form the only true oceans of the planet. Occasionally they attain a breadth in some places of 300 or 400 miles, and are then found to be of a dark blue color. The polariscope shows that, unlike the rest of Mars, their surfaces are shiny. The yellow regions are thought to be deserts. They cover more than half the entire surface. Very marked changes sometimes appear in the finer details when the snow is melting most rapidly. At the approach of the Martian autumn those parts of the dark areas that are near the poles are seen to fade out and turn yellow so as to be indistinguishable from the soil of the planet.

The moons of Mars were discovered by Asaph Hall in 1877. The outer and smaller one is probably less than 10 miles in diameter. The inner one revolves about the planet in seven hours and a half, apparently rising in the west, and goes through all its phases in a single night.

W. H. PICKERING,
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Mars, in Roman mythology, contracted from *Mavers* or *Mavors,* in the Sabine or Oscan language *Mamers,* was at an early period identified by the Romans with the Greek *Ares.* As the Italian Mars was originally a divinity of a very different nature, the two conceptions must be treated separately. Originally Mars was an agricultural deity surnamed *Silvanus,* and propitiatory sacrifices were offered to him as the tutelary god of fields and flocks. As the Italian shepherds were familiar with war, the transition from the idea of Mars as an agricultural to that of a warlike deity was natural and easy. He was regarded as the father of the Roman people, for, according to tradition, Romulus and Remus, the founders of Rome, were the fruit of his intercourse with Rhea Sylvia. Several temples in Rome and the Campus Martius were dedicated to him, the most important of which was that outside the Porta Capena, on the Appian Road, and that of Mars Ultor, built by Augustus in the forum. His service was celebrated not only by particular *flamines* devoted to him, but by the College of the Salii, or priests of Mars. The month of March, the first month of the Roman year, was sacred to him, and his festivals were celebrated every year in the Circus on the 1st of August. The Campus Martius, where the Roman youth engaged in athletic and military exercises, was named after him. See ARES.

Marsala, mär-sä'lä, Sicily, a seaport town, near the mouth of a river of the same name, on the low promontory of Cape Boeo, 18 miles southwest of Trapani. It obtained its name from the Saracens, who valued the port so highly that they called it Marsa Alla, or Port of God. The harbor has been greatly improved. The most important export is Marsala wine, which resembles sherry. Pop. (1901) 57,567.

Marseillaise, mär-sě-yāz, the celebrated song of the French Revolution, and the national anthem of the French. It was composed by Joseph Rouget de Lisle (q.v.) while an officer in the engineer corps at Strasburg, early in the French Revolution, with a view of supplanting the vulgar songs then in vogue. He composed the song and the music in one night. It was at first called 'Chant de Guerre de l'Armée du Rhin,' but subsequently received its present name because it was first publicly sung by volunteers from Marseilles in July, 1792. It became the national song of the French republicans, and was soon known through Europe and America. The tune is peculiarly stirring. It was suppressed under the first empire and the Bourbons, but the revolution of 1830 called it up anew, and after being suppressed under the second empire it is again the recognized national anthem of the French.

Marseilles, mär-sālz′, or **Marseille,** mär-sā-yē, France, the principal commercial seaport of the country, a first-class military and naval station, the second city of France as regards population, and the capital of the department of Bouches-du-Rhône, 508 miles southeast of Paris. It stands on the northeastern shore of the Gulf of Lyons, and on a bay containing a group of islets, one of which, the Château d'If, has world-wide celebrity in connection with the elder Dumas' 'Monte Cristo.' The city is strongly defended by various works, and lies in the form of an amphitheatre round a natural harbor of moderate size (about 70 acres), known as the Old Harbor. The New Harbor consists of a series of extensive docks or basins along the shore to the northwest, with a protecting breakwater in front. From the Old Harbor one of the finest of the city thoroughfares, called the Cannebière, runs inland in a straight line; while at right angles to this another great thoroughfare traverses the city, planted with trees, lined with fine edifices, and bearing different names at different points. In the older part of the town the streets are narrow and irregular, but in general the streets are spacious and regular, and lined with handsome houses. Marseilles, however, is not rich in public edifices. The chief are the large cathedral, in the Byzantine style, consecrated in 1893; the church of Notre Dame de la Garde, a modern Romanesque building, on a hill of same name, whence a splendid view is obtained; the church of St. Victor, a building of great antiquity; the Hôtel de Ville, the Prefecture, the Palais des Arts de Longchamp, containing a picture-gallery and natural history museum; the exchange; the public library (102,000 vols.); the palace of justice or law courts; the episcopal palace, etc. Marseilles is the see of a bishop, and possesses a court of first instance, a mint, an Academy of Sciences, Belles-lettres, and Arts, various learned societies and educational institutions.

Marseilles improved greatly in regard to street architecture, sanitary matters, etc., and made great progress in extent, population, and commerce, largely owing to the conquest of Algeria and the opening of the Suez Canal. Since 1855 some 200 acres have been added to the previous harbor accommodation. From the Durance an abundant water supply has been derived. A canal irrigates the neighboring slopes and plains, and has transformed them from arid tracts into fruitful fields. The surrounding districts are now occupied by a new population, employed in raising vegetables, fruit, etc., on the reclaimed and improved lands.

The most important manufactures are soap, soda, and other chemical products; also olive and other oils, sugar, machinery, iron and brass work, matches, candles, glass, earthenware, oriental hosiery, etc. In the building-docks a great number of war and other vessels are built. The
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researches in the geology of the region between the Appalachian range and the Atlantic. He was curator of the geological collection of the Yale museum of natural history in 1867–99, and in 1898 presented to the university his own collections. He was a nephew of George Peabody (q.v.), and it is said to have been at his suggestion that the Peabody Museum at Yale was established. In 1887 he was made honorary curator of vertebrate palæontology in the United States National Museum, and in 1898 received the Cuvier medal of the French Academy of Sciences. He was president of the American Association for the Advancement of Science in 1878, and of the National Academy of Sciences in 1883–95. From a bibliography of 237 titles, these works by him may be cited: ‘Odontornithes: A Monograph on the Extinct Toothed Birds of North America’ (1880); ‘Dinocerata: A Monograph of an Extinct Order of Gigantic Mammals’ (1884); and ‘The Dinosaurs of North America’ (1896). Consult memoir by C. E. Beecher in the ‘American Journal of Science,’ June 1899.

Marsh, Richard, English novelist. Among his novels, several of which have been reprinted in this country, are ‘Mrs. Musgrave and her Husband’ (1895); ‘The Crime and the Criminal’ (1896); ‘The Beetle: a Mystery’ (1897); ‘Tom Ossington's Ghost’ (1897); ‘Frivolities’ (1899); ‘Ada Vernham: Actress’ (1900).

Marsh, Sylvester, American engineer: b. Campton, N. H., 30 Sept. 1803; d. Concord, N. H., 30 Dec. 1884. In 1826 he established a provision business in Boston, in 1833 in Chicago, and from 1837 was in the grain trade at Chicago. He originated the meat-packing industry and is regarded as one of the founders of Chicago. From 1864 he resided in New Hampshire. On 25 June 1858, he obtained a charter for a railway to the summit of Mount Washington, a project deemed so impossible that he was called «crazy Marsh.» The railway, 2.81 miles long, with an ascent of 3,625 feet, was completed in July 1869. The chief feature in the operation of the road is a central cog-rail. Similar roads were built on the Rigi, Switzerland, and on Green Mount, Mount Desert, Maine.

Marsh Crocodile, or **Muegger,** the common inland crocodile of India, locally venerated by the Hindus, to whom it is known as «Muegger.» It inhabits the tanks and marshes of India and Ceylon; and suitable places westward almost to the Persian coast, and eastward throughout the Malay peninsula and islands. It is dark, olive-brown in general color above, lighter on the ventral surface; the young are paler, with black spots. A specimen 12 feet long is considered large, but instances of a length of 18 feet have been recorded. The head is rough-coated, but has no ridges; the snout is broad, and the teeth number 76. These crocodiles swarm in river-marshes, weedy ponds and artificial reservoirs, throughout their range, feeding on fish and small animals, and little feared by horses, cattle or human beings, for in general they are cowardly and reluctant to attack men or even to resist injury. In case the water of their home dries away, they migrate to other pools; and in seasons of drouth are likely to be met with anywhere wandering in search of water; as a last resort they will bury themselves in the mud and remain in a torpor until revived by the coming of rains. These reptiles display considerable cunning in capturing their food and in avoiding harm, feigning death very cleverly. They are kept in a semi-domesticated condition in many parts of India by pious Hindus, whose priests build temples near the great ponds, protect and feed the reptiles, and imagine the service pleasing to the gods as well as profitable to themselves. Extensive descriptions of the animal and of its worship may be found in the zoological works of Blanford, Jerdon, Tennent, Gadow and others, and in such volumes as Adams' ‘Wanderings of a Naturalist in India’ (Edinburgh 1867), and Hornaday, ‘Two Years in the Jungle’ (New York 1885).

Marsh Gas. See Methane.

Marsh Hare. See Hares.

Marsh Hawk, or **Harrier,** a migratory hawk (*Circus cyaneus*) of medium size, commonly known in one or another of its varieties throughout the north temperate zone, which frequents marshy meadows, where it makes its nest upon the ground in a tussock of grass, and lays five to seven roundish, dirty white eggs. In such places it finds its food, chiefly mice and frogs, and sails slowly back and forth close to the ground watching keenly for movements in the grass and ready to pounce upon its prey. Its wings are long and its flight may be swift and powerful when occasion demands, but it was accounted «ignoble» among falconers. It rarely seizes birds or even young poultry, although one of its names is «hen-harrier,» and should be protected and encouraged by farmers as one of the most useful and persistent mousers. This hawk may be readily recognized by the broad patch of white on the rump displayed by both sexes. The male is dull grayish-blue, in general tint, and the female rusty brown, both streaked with white. Consult Coues, ‘Birds of the Northwest’ (1874).

Marsh-hen. See Mud-hen.

Marsh Mallow, a coarse, large-leaved herb (*Althea officinalis*), of the Old World, but naturalized in marshy places along the eastern coast of the United States, which is related to the hollyhocks (q.v.); the flowers are pale rose-color, some in a terminal spike and some axillary. Its root is mucilaginous, and of service as a demulcent in medicine, but it is mainly used as a basis for the confection called «marsh-mallow.» Compare Mallow.

Marsh-marigold. See Cowslip.

Marsh-trefoil, a handsome marsh plant. See Buck-bean.

Marsh-wren, either of two species of American wrens that inhabit reedy marshes. They have the diminutive brown bodies, short wings and tails, the latter often held cocked up over the back, awl-like bills and inquisitive activity characteristic of wrens (q.v.) generally. One is the long-billed (*Cistothorus palustris*), most numerous in the salt-marshes along the Atlantic coast; and the other the short-billed, better known about inland lakes and rivers. The former is somewhat the larger, has a decidedly longer bill, and lays eggs dark chocolate in color, while the eggs of the short-billed species are pure white. Both make elaborate nests in the form of ball-like baskets, with a little entrance at the side, woven of leaves of wild rice or marsh grasses, and fastened to the stems of the reeds. A curious habit of the species is that each pair will make several nests each season, only one of which serves the purposes of incubation. These wrens give in the spring an exceedingly pretty chattering song, and when dozens are singing together in a patch of reeds the effect is most pleasing.

Mar'shal, a Federal officer appointed by the President in each judicial district, and corresponding to the sheriff of a county. His duty is to execute all precepts directed to him, issued under the authority of the United States, and is under the jurisdiction of the United States district and circuit courts. Sometimes police officers in American towns are known as marshals. In some European countries the title of marshal confers the highest military distinction, that of Marshal of France being especially prized. The word is derived from the Old High German word *marah,* a horse; and *scalh,* a servant; hence *Marascalh,* a man appointed to take care of horses. The marshal of the German empire derived his origin from the Frankish monarchs, and was equivalent to the *comes stabuli* or *connêtable.* He was bound to keep order at the coronation of the emperor, and to provide lodgings for the persons connected with the ceremony. He was called *arch-marshal,* a dignity belonging to the electorate of Saxony. At the coronation it was his duty to bring oats in a silver vessel from a heap in the open market-place, and to present the vessel to the emperor. His duties were discharged by a hereditary marshal (*Erbmarschall*). In Prussia general field-marshal is the highest military honor. In England field-marshal is given as an honorary rank to general officers who may have no immediate command. Marshal also signifies a person who regulates the ceremonies on certain solemn celebrations or, as in the United States, at parades, street processions, etc.

Marshall, mär'shal, **Alfred,** English economist: b. London 26 July 1842. He was educated at St. John's College, Cambridge, and in 1877 was principal of University College, Bristol. In 1883–4 he was lecturer at Balliol College, Oxford, and has been a member of various public boards. He has published: 'Economics of Industry' (1879); 'Principles of Economics' (1890); 'Elements of Economics' (1891); etc.

Marshall, Edward, American journalist: b. Enfield Centre, N. Y., 31 May 1868. He was educated in the public schools at Rochester and entered journalism in New York city, where he conducted an editorial crusade against the conditions existing in tenement buildings. He has been connected with leading New York newspapers and was special correspondent during the Spanish-American war. He has published 'The Rough Riders.'

Marshall, Emma Martin, English novelist: b. North Repps, near Cromer, Norfolk, 29 Sept. 1830; d. Clifton, near Bristol, 4 May 1899. She was married to H. G. Marshall in 1851, and her life thereafter was mainly spent in the cathedral towns of Wells, Exeter, Gloucester, and Bristol. She wrote more than 100 volumes, nearly all of them stories intended mainly, though not entirely, for young people. In spite of their number the even excellence of the tales is remarkable, and they may be called historical pictures

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war (1832), and resigned from the army 30 April 1833. Admitted to the bar in 1833, he practised in Frankfort (1833–4) and Louisville (1834–6), became a lieutenant-colonel of Kentucky militia in 1841, and raised for the Mexican War the first regiment of Kentucky cavalry, of which he was made colonel 9 June 1846. He fought at Buena Vista (22–3 Feb. 1847). From 3 Dec. 1849 to 4 Aug. 1852 he served as a Whig in the 31st and 32d Congresses, in 1852–4 was minister plenipotentiary to China, and from 3 Dec. 1855 to 3 March 1859, was again in Congress, this time as an American, or Know-Nothing. In 1861 he was commissioned a brigadier-general in the Confederate army, with command of the Army of Eastern Kentucky. On 10 Jan. 1862 he was defeated by General Garfield at Middle Creek (Floyd County) in one of the most important of the minor battles of the Civil War. In May 1862 he surprised General J. D. Cox at Princeton, Va., and was thus of much service to Lee through the relief of the Lynchburg and Knoxville railway. Having resigned his commission in 1862, he represented Kentucky in the congress of the Confederate States (1863–5). From 1867 he practised law with much success at Louisville.

Marshall, John, Chief Justice of the United States: b. Germantown (now Midland), Fauquier County, Va., 24 Sept. 1755; d. Philadelphia, 6 July 1835. He was the eldest son of Colonel Thomas Marshall of Westmoreland County, Va., a distinguished officer in the French War and in the War of Independence, and of Mary Keith a member of the well known Randolph family. Thomas Marshall removed from Westmoreland County to Fauquier soon after his marriage; this community was sparsely settled and the educational advantages which he could give his children were meager, consequently he became their earliest teacher and succeeded in imbuing them with his own love of literature and of history. For two years John Marshall had, as tutor, James Thompson of Scotland and he was sent for one year to the academy of the Messrs. Campbell of Westmoreland County, where James Monroe was also a pupil. He had no college training except a few lectures on law and natural philosophy at William and Mary in 1779. He was always fond of field sports and excelled in running, leaping and quoit throwing. He loved the free natural life of the country, and his long tramps through the woods around his father's home, Oak Hill, together with his athletic exercises gave him great strength and agility. At 18 he began the study of law but soon left his studies to enter the Revolutionary army. He was active in endeavoring to enlist men for the service and helped to form and drill a company of volunteers. As a member of his father's regiment he took part in the battle of Great Bridge where he displayed signal valor. In 1776 he became a lieutenant in the 11th Virginia, and the next year was made captain. He served in Virginia, New Jersey, Pennsylvania and New York, always displaying great courage and valor and a cheerful acceptance of hardships and privations. This experience was of untold value to Marshall, it broadened his views and quickened his insight in governmental questions. As he says, he entered the army a Virginian and left it an American. In 1780 during a period of military inactivity he attended a course of law lectures at William and Mary and in 1781, after leaving the army was granted a license and began the practice of law in Fauquier County. The next year he was elected to the Virginia Assembly, and shortly afterward was made a member of the Executive Council. He served his State as legislator during eight sessions. In 1784, although he had then removed his residence to Richmond, he was again elected delegate from Fauquier County, and in 1787 served as member from the County of Henrico. When the city of Richmond was granted a representative in the legislature Marshall had the honor of this office which he held from 1788 to 1791. He was also a member of the Federal Convention which met in 1788 to discuss the ratification of the Constitution of the United States, and it was largely due to his convincing arguments that ratification was carried, as the question was hotly debated and the anti-Constitution party had able and determined representatives. For several years he held no public office and devoted himself entirely to his extensive law practice, but in 1795 was again elected to the legislature. During this session he defended the unpopular «Jay Treaty» with England, and by his overwhelming arguments completely refuted the theory of his opponents that the Executive has no power to negotiate a commercial treaty. Marshall's attitude during his service as legislator toward all questions concerning Federal power demonstrated his increasing belief that a strong central government is necessary to real efficiency. In 1783 he had married Mary Ambler, daughter of Jacqueline Ambler, Treasurer of the State, and soon after his marriage made his permanent home in Richmond. The honors bestowed on him testify to the esteem in which he was held by the State and by the Nation. He refused the Attorney-generalship and the ministry to France, but in 1789 accepted the office of special envoy to France with Charles Cotesworth Pinckney and Elbridge Gerry. This mission related to the indignities which the French had offered the American navy and attempted to adjust the commercial relations between the two countries. It failed on account of the arrogant attitude of France, but «Marshall's dignified correspondence added greatly to the prestige of America,» and on his return he was welcomed with many evidences of approbation from his grateful countrymen. Yielding to the earnest solicitation of Washington he became a candidate for Congress and was elected a member of that body in 1798. In Congress he was the leader of the Administration party and the greatest debater in the house on all constitutional matters. In one of his most noted speeches he defended the action of President Adams in the case of Jonathan Robbins and proved conclusively that this case was a question of executive and not of judicial cognizance. In 1800 he was made secretary of state, and in 1801 appointed Chief Justice of the United States, which office he held until his death in 1835. In 1829 he, like Ex-President Madison and James Monroe, was a member of the Virginia Convention which met to alter the State Constitution, and by his wisdom and moderation did much to prevent radical changes and to thwart the attempts of politicians against the independence of the judiciary. In 1831 his health, hitherto unusually vigorous, began to fail; he underwent a severe surgical operation in Philadelphia and was seemingly restored, but the death of his wife was a great shock and a return of the disease in 1835 proved fatal. He died in Philadelphia, whither he had gone for medical relief, and was buried by the side of his wife in the New-Burying-Ground, now Shockhoe Hill Cemetery, Richmond. The sorrow over the country was deep and widespread, even his bitterest political enemies mourned for the kindly, upright man.

Though somewhat ungainly, Marshall was always dignified in appearance; his tall, loosely-jointed figure gave an impression of freedom, while his finely shaped head and strong penetrating eyes bespoke intelligence and power. Directness and simplicity were his dominant characteristics. He was free from any display of pomp, air of office or studied effect. His unfailing good humor, his benignity, his respect for women, his devotion to wife and family and his well-known reverence for religion made him loved and admired even by those who heartily disliked his political opinions. As chief justice for more than 30 years he rendered numerous decisions which were of prime importance to a nation in process of formation. The faculty which made Marshall invaluable as a jurist was his power of going directly to the core of any matter. No subtleties, no outside issue confused him, his analysis was unerring, his logic incontrovertible; he cared nothing for the graces of rhetoric and made no appeal to the emotions; his power lay in his deep conviction and in his illuminating and progressive argument. At a period when the powers of the Constitution were ill-defined, when our government was experimental, Marshall's decisions in Constitutional and international cases were invaluable factors in forming a well-organized Federal government. "He made the Constitution live, he imparted to it the breath of immortality, and its vigorous life at the present hour is due mainly to the wise interpretation he gave to its provisions during his long term of office." Marshall was the author of numerous reports and papers, of a history of the colonies, and of a 'Life of Washington,' a book of small literary merit, but containing a mass of valuable authentic information. Consult: Cooley, 'Constitutional History of the United States' (1889); Margruder, 'John Marshall' (1885); Thayer, 'John Marshall' in 'Beacon Biographies' series (1901).

EMILIE W. MCVEA,
Of the University of Tennessee.

Marshall, Ill., city, county-seat of Clark County; on the Vandalia Line and the Cleveland, C., C., & St. L. R.R.'s; about 122 miles east by south of Springfield and 15 miles west by south of Terre Haute, Ind. It is in an agricultural and stock-raising region. Its chief manufactures are flour, woolen goods, condensed milk and other dairy products, and lumber. It has considerable trade in farm products, live-stock, and condensed milk. Pop. (1900) 2,077.

Marshall, Mich., city, county-seat of Calhoun County; on the Kalamazoo River, and on the Michigan C. and on the Cincinnati, J. & M. R.R.'s; about 38 miles south by west of Lansing and 100 miles west of Detroit. The surrounding country is devoted chiefly to agriculture. The principal manufactures are school and church furniture, hot-air furnaces, patent

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Marston Moor, England, in Yorkshire, is celebrated for the defeat there in 1644 of the royal forces under Prince Rupert, by the Parliamentary troops under Fairfax and Cromwell.

Marsu'pial Frog, any of several small tree frogs (*Hylidæ*) of the South American genus *Nototrema,* which incubate their eggs in brood-pouches formed by infoldings of the skin on the back of the female. The eggs are few, of large size, and abundantly provided with food-yolk, and the young sometimes remain in the pouches after hatching until they have completed their metamorphosis and attained considerable growth; but the species vary in this respect. In one case the opening is a longitudinal slit along the middle of the back, with a brood-pouch on each side; but in the other species the double pouch opens cross-ways, near the caudal extremity of the body, and may be closed by a sphincter muscle. About half a dozen species are catalogued, all natives of the forests of tropical America, and none is common or thoroughly well known. Gadow ('Amphibia and Reptiles,' 1901) concedes that the best account of them is still that of Weinland in 'Archive für Anatomie und Physiologie' for 1854.

Marsupial Mole, a small burrowing marsupial of southern Australia (*Notoryctes typhlops*), called «urquamata» by the natives, which has a remarkable similarity to a true mole in appearance (except its reddish color), adaptations of structure to an underground life, and habits. It feeds upon ants and other insects, and often emerges and travels above ground, though the front feet have been so transformed into digging organs as to make them of little service for walking. It represents a family (*Notoryctidæ*) first described by Stirling in the 'Transactions' of the Royal Society of South Australia for 1891.

Marsupia'lia, the marsupial mammals, a group ranked as an order, yet embracing the whole of the superior group *Metatheria* or *Didelphia,* as it has been variously named. The latest investigations, however, tend to invalidate the distinctions upon which these groups were formerly sharply separated from the higher mammals, and to cause the marsupials to be regarded only as an order of *Eutheria* (q.v.), now distinguished chiefly by their extremely local distribution and degenerate non-placental type of reproduction. Their origin was extremely ancient, and its sources are not known; but the group appears to have arisen in Mesozoic times among the earliest of mammalian forms, and to have begun, even before the advent of the Tertiary period, a course of special modification and degeneration, especially in the line which has survived to the present. The former belief that the marsupials stood in the direct line of ancestry of mammals generally, which were thus considered as modified and diversified offshoots from this stock, is no longer held; on the contrary, the marsupials are regarded as a branch from some very early generalized stock, if not a group of independent origin. It is noteworthy, says Woodward ('Vertebrate Palæontology,' 1898), that the earliest known complete mammalian skeletons, which pass upward by insensible gradations into undoubted *Eutheria,* are scarcely distinguishable from the skeletons of the more generalized existing mar-

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of Tertiary forms once prevalent in South America, save a single Patagonian diprotodont, the opossum-rat (q.v.). The home of the group, then, is Australia, Tasmania, and the Papuan group, where about 125 species are known; and the race seems to have survived in that insular region owing to the absence of destructive enemies, for most of them are almost defenseless vegetable feeders. They have, however, developed into a great variety of forms under the influence of varying conditions and long competition, and present a most curious parallel to the diversities observable among the higher and more widely diffused mammalia. Some have large size, go in herds, and occupy grassy plains; others are smaller, more agile, and confined to mountainous districts. Others are still smaller, burrow, and feed upon roots, or resemble little terrestrial rodents in appearance and habits; while many forms dwell altogether in trees, and often simulate squirrels of various kinds. In another direction have been evolved a variety of predatory marsupials, whose needs have developed bodies, teeth, and powers resembling those of wolves or bears, and which are wholly flesh-eaters. There is, in fact, hardly a group of mammals which does not find a counterpart among the marsupials,—even the moles and shrews.

The classification of the order divides it into 10 or 12 well-defined families, some of which are wholly extinct, as follows:

POLYPROTODONTIA:

Doubtful primitive forms,—*Triconodon*, Amphitherium, etc.

Didelphyidæ.— Opossums (q.v.).

Dasyuridæ.— Dasyures, Thylacines, etc. (qq.v.).

Peramelidæ.— Bandicoots (q.v.).

Notoryctidæ.—Marsupial Moles (q.v.).

DIPROTODONTIA:

Epanorthidæ; Abderitidæ, etc.— Fossil in the Miocene strata of Patagonia; but surviving in *Cænolestes* (q.v.).

Phalangeridæ.— Phalangers (q.v.).

Diprotodontidæ.— Extinct gigantic phalangers.

Phascolomyidæ.— Wombats (q.v.).

Macropodidæ.— Kangaroos (q.v.).

Consult: Beddard, ‘Mammalia’ (1901); Thomas, ‘British Museum Catalogue of Marsupialia,’ etc. (1888); Gould, ‘Mammals of Australia’ (1863); and scientific works on Australia, especially those of Waterhouse, Aflalo, and Lydekker.

Marsyas, mär'sĭ-as, mythological son of Olympos, Œagrus, or Hyagnis. Athena, having seen the reflection of herself in the water, had thrown away the flute which she had invented, displeased because it disfigured the countenance in playing, and had pronounced the severest maledictions against any one who should take it up. Marsyas accidentally found this instrument, on which he soon acquired such skill that he dared to challenge Apollo to a contest, the conditions of which were that the victor should do what he pleased with the vanquished. The Muses, or according to others the Nysæans, were invited to be the umpires. The Muses decided in favor of Apollo, who put to death his rash competitor by binding him to a tree and flaying him alive. In this way was the curse of Athena accomplished.

Martel', Charles. See CHARLES MARTEL.

Martel'lo Towers, so called by corruption from *Mortella,* in Corsica, where a strong tower maintained a determined resistance to a superior English force in 1794. In consequence of the great strength exhibited by this fort the British government erected a number of similar towers round the coast of Great Britain, and especially on the Kentish coast, as a defense against the threatened invasion from France. They are circular, with walls of great thickness, and roofs bomb-proof, and consist of two stories, the lower for the reception of stores, and the upper for the casement of troops. One traversing gun was mounted upon each, in working which the men were secured by the lofty parapet. The ordinary guard was from six to twelve men. Martello towers having come to be considered a failure, were in many places dismantled, but some have received a new and more powerful armament, or have been adapted to the use of the coast guard, or revenue officers. In some instances they are rented to private individuals. Martello towers are still to be found in New Brunswick and Nova Scotia. There are also several on the Gulf of Mexico and one still remains at Kingston, Canada.

Mar'ten, the name of several fur-bearing animals of the weasel family (*Mustelidæ*), which are mainly arboreal in their habits, and do not change their color to white in winter. The common European marten (*Martes,* or *Mustela, foina*), or “fou'mart,” is found in Europe generally, as also is the pine marten (*M. abietum*), although the latter is rarer in Britain. The former breeds in hollow trees, and produces from three to seven young at a birth. They feed on the smaller wild mammals, such as rats, mice, etc., but also attack birds and devour eggs. They are said to be fond of honey, and even to eat fruits and grain. The pine marten occurs chiefly in North America and in the northern parts of Asia. It is of smaller size than the common marten, has a finer fur, and possesses a yellowish mark on the throat. It burrows in the ground, carries the young about six weeks, and brings forth from four to seven in a litter about the end of April. The fur is used for trimmings, and upward of 100,000 of these animals are annually hunted and killed in the fur countries, yet this marten remains fairly numerous. The famous sable marten (*M. zibellina*), which furnishes the highly valuable sable fur, is nearly allied to the pine marten. It inhabits Siberia, and vast numbers of this species are killed annually for the sake of the fur. The pursuit of these animals is described as a task involving much difficulty, discomfort, and even peril. The American sable is furnished by the *M. americana,* and Pennant's marten (*M. canadensis*), or the fisher, pekan or black cat, as it is popularly called among northern hunters, is another well-known species. Both these last named are now almost restricted to the remote Canadian woods, although formerly numerous in the northern part of the United States. Various opinions are held by naturalists as to the specific distinction of several of the species above named, which furnish few very definite characters for separation from one another. Consult Coues, ‘Fur-Bearing Animals’ (1877).

Martha's Vineyard, Mass., an island off the southern coast, in the County of Dukes. It is separated from the mainland by Nantucket and Vineyard Sounds, from Nantucket Island by Hukeget Channel, and from Elizabeth Islands by Vineyard Sound. It is about 20 miles long and 11 miles across the widest part. The northern coast is high and rocky, with a few indentations, the largest of which is Vineyard Haven. The southern coast is low and irregular, with sand bars and shallow lagoons. On the southwest is Gay Head, 200 feet above the water. A lighthouse is on Gay Head Point. Edgarton, the county-seat, is the principal town on the island. Bartholomew Gosnold discovered and named the island in 1602. The Indians, who then occupied the place, were quiet and friendly, and all became Christians. They remained loyal to the whites even during King Philip's War. The island is a favorite summer resort; annual camp-meetings and summer schools have been held here for a number of years. Pop. (1900) 4,561.

Marti, José Julián, ho-sā' hoo-lē-ān' mär'tē, Cuban author and patriot: b. Havana 28 Jan. 1853; d. Dos Rios, Cuba, 19 May 1895. He studied in Havana, was sent to the quarries while only a boy as a political suspect, then went to Spain, where in Madrid and Saragossa he studied for the bar and made himself famous for his liberal views, and on his return to America was professor in the University of Guatemala, whence he came to New York city as consul for Uruguay, Paraguay, and Argentina. In 1894 he attempted to land armed men in Cuba, but was intercepted in Florida; in the next year he succeeded in landing, joined Gomez, and was killed in a skirmish with the Spanish at Dos Rios. Marti founded the Cuban organ of independence in New York city, 'La Patria,' was a poet, and wrote a Spanish translation of Helen Hunt Jackson's 'Ramona' (1888).

Martial, mär'shĭ-al (MARCUS VALERIUS MARTIALIS), the world's greatest writer of epigrammatic poetry, was born in Bilbilis, Spain, 1 March of one of the years 38 to 41 A.D., and died probably between 102 and 104 A.D. Like his literary friends, the Senecas, Lucan and Quintilian, who also were of Spanish birth, Martial in his writings was thoroughly Roman, and indeed has left us our most valuable picture of contemporary Rome. A Fronto and Flacilla, whom he mentions, may have been his parents, but we know nothing of their origin or station. The grammatical and rhetorical training which his parents secured for him perhaps at Tarraco or Corduba, he half-seriously disparaged as being of no financial advantage, but it was really to his pen that he owed, at least indirectly, his support through life. For, although he was apparently fully equipped for practice at the bar, the profession of an advocate was too exacting to be attractive. On his arrival in Rome, perhaps in 64 A.D., powerful friends launched him on a literary career which rapidly carried his fame even to the limits of the empire. But success as a poet brought him no contentment, since in return for the money, food, clothing, etc., which by flattery and begging he got from imperial courtiers and other men and women of wealth, he had daily to perform social duties that were highly irksome to his indolent nature. From the patron's reception at dawn to

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When in time of extreme peril to the State, either from without or from within, the general safety cannot be trusted to the ordinary administration, or the public welfare demands the adoption and execution of extraordinary measures, it may become necessary to declare the existence of martial law. This is, indeed, no law at all in its ordinary sense; it is in fact the abrogation of it. That which is done under martial law has not an immediate constitutional or legislative sanction, as the military or the statute law, for example, has. Yet remotely and indirectly martial law expresses the will of the people. The Supreme Court of the United States has held that a State legislature may proclaim its existence whenever the public safety demands it; and the Constitution, by implication at least, also permits its proclamation by that clause which provides that the privileges of the writ of *habeas corpus* shall not be suspended, unless when, in cases of rebellion or invasion, their suspension is essential to the general welfare. See also Court-Martial; Law; Military.

Mar'tin, Saint, of Tours: b. about 316; d. about 400. He attended the catechetical school at Pavia. His father was a military tribune, and compelled him in his 16th year to take up arms. He is said to have early escaped from his father and received instruction in a Christian Church. He served under Constantius and Julian, and went to Gaul, where he appeared as the model of all virtue. Among other acts he divided his cloak with a poor man whom he met at the gates of Amiens (Ambianum). The legend says that Christ appeared to him in the following night covered with the half of this cloak. Soon after this vision Martin was baptized, in 337. After living many years in retirement he made a visit to his native place, during which he converted his mother, and opposed with zeal the Arians who prevailed in Illyria. For this he was scourged from the country, on which occasion he manifested the firmness of a martyr. He now established a monastery in Milan, but when he found himself again exposed to persecution took refuge on the Island of Gallinaria, in the Ligurian Sea. He next settled at Poitiers, where he assembled a number of monks, and is said to have wrought many miracles. In the year 375 (according to others 371 or 374) the bishopric of Tours was conferred on him against his will. In order to withdraw himself from the world he built the famous convent of Marmoutiers, between the river Loire and a steep rock. This is regarded as the oldest abbey of France.

Martin, the name of five popes of the Catholic Church, as follows:

Martin I., Saint: b. Todi, Tuscany; d. Cherson, Crimea, 16 Sept. 655. He was elected pope in 649, succeeding Theodore I. He summoned the first Lateran Council at which he caused the doctrine of two wills and operations in Christ to be affirmed. The Emperor Constans II. upholding the doctrines which the Council had condemned, took the pope prisoner and brought him to Constantinople on a charge of treason and then banished him to the Crimea. On account of his sufferings he is numbered among the saints. His day is 12 November.

Martin II., or **Marti'nus I.:** b. Montefiascone; d. Rome 14 Feb. 884. He was elected pope in 882 after the death of John VIII. While bishop of Caere he had been legate for three popes in their negotiations with the East. To English King Alfred he sent a piece of the wood of the Cross.

Martin III., or **Martinus II.:** b. Rome; d. 946. He succeeded Stephen VII. in 942 and was greatly esteemed for his learning and nobility of character.

Martin IV. (Simon de Brion, sē-môṅ dė brē-ôṅ): b. France; d. Perugia 28 March 1285. He succeeded Nicholas III. in 1281, having previously been canon of Tours, and cardinal from 1261. He owed his election in great measure to the influence of Charles of Anjou, whom he supported thereafter and did all in his power to enable that monarch to retain possession of Sicily. In his pontificate occurred the massacre known as 'The Sicilian Vespers.'

Martin V. (Ottone Colonna, ŏt-tō'nā kō-lŏn'nä): b. Rome 1363; d. there 20 Feb. 1431. He was elected pope in 1417, after the abdication of Gregory XII., and the deposition of John XXIII. and Benedict XIII., during the Council of Constance. His first act was to promulgate a bull against the Hussites, remarkable from the circumstance that in it the pope seems to recognize the supreme authority of the councils. He was one of the ablest of the popes, and through his efforts unity was finally secured to the Church and peace to Italy. In 1418 he dissolved the Council of Constance, though a number of difficulties were not then adjusted, and dissensions continued in the Church. Benedict XIII. still lived; and at his death, in 1424, a new anti-pope was elected in Clement VIII., who renounced his pretensions in 1429, when he received the bishopric of Minorca as an indemnification.

Martin, Charles Cyril, American civil engineer: b. Springfield, Pa., 30 Aug. 1831; d. Far Rockaway, N. Y., 11 July 1903. He was educated at Rensselaer Polytechnic, Troy. He was engineer in the Brooklyn navy yard during the Civil War; and afterward chief engineer of Prospect Park, Brooklyn; and was appointed John A. Roebling's second assistant in building the Brooklyn Bridge, of which he became chief engineer after Roebling's retirement.

Martin, François Xavier, American jurist: b. Marseilles, France, 17 March 1764; d. New Orleans 11 Dec. 1846. He emigrated to Martinique when 18; later removed to New Berne, N. C.; taught French there and became a printer; studied law, being admitted to the bar about 1789; and in 1792 was requested by the State legislature to compile the British statutes in force before the Revolution. He was himself a member of the Assembly in 1806-7; was judge of the Mississippi Territory in 1809; went to Louisiana in the same capacity in 1810; and in 1813 became attorney-general of the new State of Louisiana. From 1815 until just before his death Martin was a member of the Supreme Court of the State. Although blind for the last 10 of these 31 years, his ability was not impaired, and it is due to him that the law of the State was in some measure evolved from the tangle of French and Spanish statutes in which he found it. He wrote a ‹History of North Carolina› (1829); ‹History of Louisiana› (1827), and a version of Pothier on Obligations.

Martin, Helen Faucit, LADY. See FAUCIT, HELEN.

Martin, Henry Austin, American surgeon: b. London 23 July 1824; d. Boston 7 Dec. 1884. He came to the United States at an early age and was graduated from the medical school at Harvard in 1845, when he established a practice in Boston. He served as a surgeon until nearly the close of the Civil War, when he resigned and was brevetted lieutenant-colonel for gallant service. He devoted his attention principally to surgery and to the treatment of smallpox, upon which subject he was a generally recognized authority. He was the originator of many important innovations in the field of surgery and published valuable professional articles in periodicals.

Martin, Homer Dodge, American painter: b. Albany, N. Y., 28 Oct. 1836; d. St. Paul, Minn., 12 Feb. 1897. He was elected a member of the National Academy of Design in 1875; and resided in France in 1882–6. While he was influenced somewhat by the Barbizon School of painters, he developed a style entirely his own, which placed him among the best known of American landscape painters. His works include ‹Landscape on the Seine›; ‹An Equinoctial Day›; ‹Brook in the Woods›; ‹In the Adirondacks›; ‹Sand Dunes on Lake Ontario›; and ‹White Mountains, from Randolph Hill.›

Martin, Josiah, English colonial governor in America: b. probably in Antigua, West Indies, 23 April 1737; d. London, England, July 1786. He rose to the rank of lieutenant-colonel in the British army in 1771, and in the same year was appointed to the royal governorship of North Carolina. He was successful in pacifying the «regulators,» many of whom remained zealous Tories; and took a firm and energetic attitude in the maintenance of British authority. But on 24 April 1775 he was compelled to escape to the sloop Cruiser, from which on 8 August he issued a prodigiously long proclamation which the Whigs ordered burnt by the hangman. He was with Sir Peter Parker at Charleston (June 1776), and accompanied Cornwallis into North Carolina after the British victory over Gates at Camden; but in March 1781 withdrew to Long Island, and thence went to England.

Martin, Luther, American lawyer: b. New Brunswick, N. J., 9 Feb. 1748; d. New York 10 July 1826. He was graduated from the College of New Jersey (Princeton) in 1766; studied law at Queenstown, Md., was admitted to the Maryland bar in 1771; in 1774 was one of the commissioners appointed to oppose the claims of Great Britain; in 1778 became attorney-general of Maryland; and in 1787 was a delegate from Maryland to the convention that framed the Constitution of the United States. His opposition to the instrument was so strong that, rather than sign it, he left the convention, thus earning from Jefferson the sobriquet of «the Federal bull-dog.» In 1804 he defended Samuel Chase (q.v.) in the latter's impeachment trial before the Senate, and in 1805 resigned his attorney-generalship and resumed private practice. He was counsel for Burr in Burr's trial at

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had been known as a Unitarian, but she now showed a decided leaning towards Positivism, and in 1853 published a condensation of Comte's 'Positive Philosophy.' Among her other works of importance may be mentioned her 'History of England during the Thirty Years' Peace' (1849). During the last twenty years of her life her writings consisted mainly of pamphlets and contributions to newspapers and periodicals. A remarkably candid autobiography which had been written for many years was published after her death (1877). Consult also Miller, 'Harriet Martineau' (1884).

Martineau, James, English Unitarian clergyman and philosopher: b. Norwich 21 April 1805; d. London 11 Jan. 1900. His father, Thomas Martineau, the great-grandson of a Huguenot surgeon who left France after the revocation of the Edict of Nantes, was a manufacturer of bombazines. Harriet Martineau (q.v.) was an elder sister. He was sent to Derby in 1821 to study civil engineering, but in the following year became a student of Manchester College, now at Oxford, then at York. On the completion of his college course in 1827 he took charge for a year of Dr. Lant Carpenter's school in Bristol, and in 1828 he accepted a call to the co-pastorship of Eustace Street Presbyterian Church, Dublin. In 1831 he published 'Hymns for Christian Worship,' and next year resigned his pastorate, but shortly afterward accepted the co-pastorate of Paradise Street Chapel, Liverpool, of which, in 1835, he became sole pastor. In 1836 appeared his first separate original work, 'The Rationale of Religious Inquiry,' which attracted considerable attention. In 1839 he was associated with J. H. Thom and Henry Giles in the defense of Unitarianism against attacks by orthodox clergymen, and of the 13 addresses published in 'Unitarianism Defended' (1839) five were by Martineau. In 1840 he published his collection of 'Hymns for the Christian Church and Home,' and in the same year was appointed professor of mental and moral philosophy and of political economy in his old college, now located in Manchester and named Manchester New College. On the removal of the college to London in 1853 he retained his professorship, but did not settle in London till 1857. In 1848-9 he spent 15 months on the Continent, mostly in Germany, during which his philosophical opinions were profoundly influenced by the study of Greek and German philosophy under Trendelenburg. The remaining publications of his first Liverpool period are an essay on 'The Five Points of Christian Faith' (1841), and the well-known collection of sermons entitled 'Endeavors after the Christian Life' (1843-7). During the period 1849-57, when he was pastor of Hope Street Church, Liverpool, he published many articles in reviews, among them that on 'Mesmeric Atheism,' which finally completed his sister Harriet's estrangement from him. In 1859, being now in London, he and J. J. Taylor, principal of Manchester New College, were chosen joint ministers of Little Portland Street Chapel, but from 1860 till his resignation in 1872 Martineau alone supplied the pulpit. On Taylor's death in 1869 he became principal of the college, a post which he held till his resignation in 1885. In 1866 he was a candidate for the chair of logic and mental philosophy in University College, London, but the united opposition of orthodoxy and secularism led by George Grote managed to defeat him by a single vote. His publications during his connection of 28 years with Manchester New College in London comprise: 'Studies of Christianity' (1869), a volume of sermons; 'Why Dissent?' (1871); 'Hymns of Praise and Prayer' (1873); 'Religion as affected by Modern Materialism' (1874); 'Modern Materialism: Its Attitude towards Theology' (1876), a masterly attack on Tyndall and the scientific materialists; 'Essays, Theological and Philosophical' (1875); 'Hours of Thought on Sacred Things' (1876-80), a collection of the sermons of his maturer period; 'Ideal Substitutes for God Considered' (1880), a criticism of Moral Idealism; 'The Relation between Ethics and Religion' (1882); 'A Study of Spinoza' (1883), his first great philosophical work; and 'Types of Ethical Theory' (1885), the earlier of his two masterpieces. During the remaining years of his life he published his great defense of the essential principles of religion entitled 'A Study of Religion: Its Sources and Contents' (1888); and his freely critical 'Seat of Authority in Religion' (1890); besides a volume of 'Home Prayers with Two Services for Public Worship' (1891), and a collective edition in four vols. of many of his 'Essays, Reviews, and Addresses' (1891). The first academical degree conferred upon him was that of LL.D. by Harvard in 1872, but he received later the degrees of S.T.D. from Leyden (1875), D.D. from Edinburgh (1884), D.C.L. from Oxford (1888), and Litt.D. from Dublin (1892). Martineau was one of the most eminent preachers of his time, but his greatest work was done in the fields of ethics and philosophical theology. At first a necessarian and utilitarian, he was latterly the greatest modern champion of free-will and intuitionalism. In the development of his Christology from a sort of Arianism to complete Humanitarianism, and in his ever-increasing insistence upon the continuity of revelation and the purely internal character of ultimate religious authority, he sums up more than any other the history of Unitarianism, and indeed of liberal theology generally during the 19th century. He was a powerful and eloquent champion of Theism against scientific agnosticism and materialism. All his works are written in a uniquely rhythmic style, characterized by a profuse and happy use of figurative language. Consult Jackson, 'James Martineau: A Biography and a Study' (1900); Sidgwick, 'Lectures on the Ethics of Green, Spencer and Martineau' (1902); Drummond, 'Life and Letters of James Martineau'; and Upton, 'A Survey of Philosophical Work' (1902).

Martinelli, mär-tē-nĕl'lē, **Sebastian,** papal delegate to the United States: b. Lucca, Tuscany, 20 Aug. 1848. He was educated at the College of St. Augustine in Rome and was ordained to the priesthood in 1871. He became superior-general of the Augustinian Order throughout the world and in 1894 was sent to America to visit the monks of that order and shortly afterward was designated apostolic delegate to the United States. In 1896 he was made a special archbishop, and in 1901 was elevated to the cardinalate.

Martinengo-Cesaresco, mär-tē-nĕn'go chä-zä-rĕs'kō, COUNTESS **Evelyn Lilian Hazeldine**

Carrington, Anglo-Italian author: b. England. She was married to the Count Eugenio Martinengo Cesaresco, an Italian writer, and has published ‘Essays in the Study of Folk Songs’; ‘Italian Characters’; ‘The Liberation of Italy’; ‘Cavour’ in the ‘Foreign Statesmen’ series; (all these books have been translated into Italian); ‘Lombard Studies’ (1902); etc.

Martinez, Enriquez, ĕn-rē′kĕth mär tē neth, or **Enrico,** Mexican engineer: b. about 1570; d. in Mexico, 1632. His birthplace is variously given as Germany, Holland, Spain (in Ayamonte, Andalusia), or Mexico. He studied engineering in Spain; went to Mexico as interpreter to the Inquisition and with the title of cosmographer royal; and in 1607 undertook to drain the valley of Mexico, threatened by lakes Zumpango and San Cristobal. His canal was fairly successful but inadequate, and after various experiments on the part of other engineers, with whose work Martinez was accused of tampering, he was bidden enlarge his tunnel and canal. He died before the work was much more than started. Martinez established a printing-press in the City of Mexico, and wrote on the natural history of Mexico, on astronomy, and on trigonometry.

Martinez de Cam′pos, Arsenio. See CAMPOS, ARSENIO MARTINEZ.

Martinez de Rozas, Juan, hoo-än′ mär tē-nĕth dā rō′zäs, Chilean statesman: b. Mendoza, Argentina, 1759; d. there 3 March 1813. He was educated at Cordova; studied law at Santiago; became professor at San Carlos, Chile, in 1781; in 1787 was made assistant intendant of the province of Concepcion; and in 1796 had risen to the second command in the presidency. He took a prominent part in planning the revolution of 1810; was a member of the governing junta until 1811, when he became its president; and showed himself an able administrator and a brave soldier. Carrera quarreled with him, got the upper hand, and banished him to his birthplace, only a few months before his death.

Martinez, mär-tē′nĕz, Cal., town, county-seat of Contra Costa County; on the Strait of Karquines, and on the Southern Pacific railroad; about 30 miles northeast of San Francisco, and 85 miles southwest of Sacramento. It is near valuable mines and also rich farm lands, on which large quantities of wheat are raised. A novitiate of the Christian Brothers is here, and the Brothers maintain a library which has about 6,000 volumes. Pop. (1900) 1,380.

Martini, mär-tē′nē, **Simone,** Italian painter, sometimes mistakenly called Simone Memmi: b. Siena 1284; d. Avignon 1344. He was the founder of the Sienese school of painting and executed frescoes in the churches of Siena, Assisi, Naples, and Orvieto. At the invitation of Pope Benedict XII. he went to Avignon, and in collaboration with his brother Donato decorated the papal palace. He seems to have aimed at flat decorative effect, rather than artistic boldness and originality in his wall painting, and his color is harmonious and fresh, though his faces are conventional. The large painting of the Madonna on the walls of the Palazzo Pubblico is his most important work at Siena (1315); at Florence is to be seen an ‘Annunciation’ of his in the Uffizi, and fragments of his work also
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Authority on Spanish America.

Mar'tin's Ferry, Ohio, city, in Belmont County; on the Ohio River, and on the Pennsylvania, the Cleveland, L. & W., the Wheeling B. & T., and the Wheeling & L. E. R.R.'s; almost opposite Wheeling, W. Va. The first settlement was made in 1769 and in 1865, nearly a century later, it was incorporated as a village. The charter under which it is now governed was granted in 1885. It is situated in a region noted for its abundance of bituminous coal, iron, and limestone. The chief manufactures are iron, steel, stoves, shovels, nails, glass, tin, machine-shop products, lumber, barrels, and boxes. The city owns and operates the electric-light plant and the waterworks. Pop. (1890) 6,250; (1900) 7,760.

Martinsburg, mär'tĭnz-bėrg, W. Va., city, county-seat of Berkeley County; on the Cumberland V. and the Baltimore & O. R.R.'s; about 65 miles northwest of Washington, D. C. It is in the vicinity of valuable stone quarries and forests which furnish timber for many mills. The chief manufactures are hosiery, woolen goods, lime, wagons, lumber, and canned goods. The repair shops of the Baltimore & Ohio Railroad and slate and limestone quarries furnish employment for a number of people. The chief buildings are the government building, which cost $100,000; the Berkeley Female Seminary, the Berkeley Female Institute, and the King's Daughters' Hospital. The waterworks are owned and operated by the municipality. Pop. (1900) 7,564. Martinsburg, as the chief city of the lower Shenandoah Valley, on the main road leading across the Potomac, the converging point of several roads, with the Baltimore & Ohio Railroad running through it, was an important point in the military operations of the valley during the Civil War. Then it was in Virginia. Early in July 1861 Gen. Patterson, after a slight skirmish, occupied the place, the Confederates falling back to Winchester. Patterson soon abandoned it, and it was reoccupied by the Confederates. Early in March 1862 it was again occupied by the Union forces under Gen. Banks, the Confederates falling back up the Valley. It was abandoned 25 May 1862, after Banks' defeat at Winchester, but soon reoccupied by Banks. On 8 Sept. 1862 Gen. Julius White was in command of the place with about 2,500 men of all arms. At this time Gen. Lee had crossed the Potomac and was at Frederick, Md. On the 10th Jackson led a column from Frederick, crossed the Potomac at Williamsport, and moved on Martinsburg. White retreated during the night of the 11th to Harper's Ferry. In June 1863, when Ewell's corps moved down the valley on the Gettysburg campaign the place was held by Col. B. F. Smith with 1,200 infantry and a battery. On 13 June Ewell, at Cedarville, detached Jenkins' cavalry brigade and Rodes' infantry division to surround and capture the Union forces at Berryville and Martinsburg. Both garrisons escaped, Smith, with the greater part of his infantry, crossing the Potomac at Shepherdstown and making his way to Maryland Heights. The battery retreated by the Williamsport road, was pursued, and lost five of its six guns, with 200 infantry accompanying it. On 1 July 1864 the place was held by Gen. Sigel with about 3,200 infantry and dismounted cavalry, and a battery. On the 2d Early arrived at Winchester on his campaign to menace Washington and, under Gen. Lee's instructions, first to clear out the lower Valley and wreck the Baltimore & Ohio Railroad. Parties were sent north and west against the railroad, and on the 3d Bradley T. Johnson, with a cavalry brigade, was ordered to move through Smithfield and Lee Town, cross the railroad at Kearnysville, east of Martinsburg, and, pushing north, unite with McCausland at Hainesville beyond Martinsburg. Johnson arrived at Lee Town early in the morning, where he was met by Col. J. A. Mulligan with about 2,000 men and a battery, and after a hard fight was driven back on the divisions of Rodes and Ramseur, which were supporting him. Breckinridge's division, which marched on the main road to Martinsburg, drove before it Stahel's cavalry, on outpost at Darkesville. Sigel, warned of approaching danger, burned his stores, collected his command, and, leaving Martinsburg on the night of the 3d, crossed the Potomac at Shepherdstown and occupied Maryland Heights. Early cleared the Valley and advanced on Washington, and on the 11th Martinsburg was occupied by Sullivan's division of Hunter's command, and remained in Union occupation until the 25th, when Crook, being defeated by Early at Kernstown, was driven through Winchester, made a short stand at Martinsburg, and recrossed the Potomac at Williamsport, Early again occupying the town and destroying the railroad on either side of it, and continuing in possession until 10 August, when, upon Sheridan's advance to Halltown, he abandoned Martinsburg and Winchester and fell back to Strasburg. He advanced from Strasburg on the 17th and reoccupied Martinsburg on the 19th with his cavalry. From this time until 17 September the place was held alternately by Union and Confederate cavalry, on the 17th by Averell's Union division. On that day Early left Winchester with a heavy force of infantry, cavalry, and artillery, and on the 18th attacked and drove Averell from Martinsburg across the Opequon. Sheridan defeated Early on the Opequon on the 19th, and drove him up the Valley; and Martinsburg was again occupied by Union troops, to remain in their possession until the close of the war.

E. A. CARMAN.

Mar'ty, Martin, Roman Catholic bishop: b. Schwyz, Switzerland, 12 Jan. 1834; d. St. Cloud, Minn., 19 Sept. 1896. He received a collegiate education in Switzerland and Austria, was ordained to the priesthood in 1856 and in 1860 came to the United States. He assisted in the founding of a priory at St. Meinrad's, Ind., and was its first superior; through his efforts the priory became an abbey in 1870 and Marty was raised to the rank of mitred abbot. He resigned his office several years later in order to perform mission work among the Indians of Dakota, over whom he gained a wide influence. He mastered their language and wrote a Sioux grammar and dictionary. In 1880 he became the first bishop of Sioux Falls, and in 1894 was transferred to St. Cloud, Minn.

Martyn, mär'tĭn, **Henry**, English missionary to India: b. Truro, Cornwall, 18 Feb. 1781; d. Tokat, Asia Minor, 16 Oct. 1812. He was graduated from St. John's College, Cambridge, in 1801; became a fellow of the same college in the next year; and, turning from the law, took orders, and landed in India in 1806. After three years at Dinapore he was transferred to Cawnpore, where he opened a church in 1810, in spite of violent opposition, and where he completed a Hindustani version of the New Testament. To perfect a translation of the New Testament into Persian and to recover his health in 1811 he traveled into Persia. In Tabriz he was taken ill with a fever; and on his hurried journey home was compelled to stop at the plague-stricken town of Tokat, where he died. He was the great missionary hero of the Church of England up to the early part of the 19th century. Martyn's works include 'Controversial Tracts on Christianity and Mohammedanism,' and versions of various parts of the Bible into Hindustani, Persian, and Judæo-Persic. Consult the lives by Sargent (1819), Bell (1880), and George Smith (1892); as well as Martyn's 'Journals and Letters' (1837). The beautiful baptistery of the modern cathedral of Truro is a memorial to Martyn.

Martyn, William Carlos, American Presbyterian clergyman and historical writer: b. New York 15 Dec. 1843. He was graduated from the Union Theological Seminary in 1869, was ordained to the Presbyterian ministry in that year,
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